Virginia Medical Monthly

Official Publication of the Medical Society of Virginia

Vol. 61, No. 1.
WHOLE No. 982.

RICHMOND, VA., APRIL, 1934

$2.00 A YEAR
25 CENTS A COPY

THE DIAGNOSIS AND TREATMENT OF RHEUMATIC HEART DISEASE IN CHILDREN.*

JAMES ALEXANDER LYON, M. D., F. A. C. P.,
Washington, D. C.

Rheumatic infection is unquestionably the most frequent cause of heart disease in childhood. Lewis,[1] of London, is of the opinion that, if congenital malformations be excluded, rheumatism is the only important cause of chronic carditis in early life. In New England, for instance, in a series of 448 cases of heart disease occurring in patients under twenty years of age, 415 (93 per cent) were rheumatic in type, twenty-eight (6 per cent) were of congenital origin, and only five (1 per cent) originated in other conditions.[2] This relative incidence varies in different regions, the southern latitudes showing a smaller percentage. Material gathered by Coburn[3] and his associates indicates that rheumatic heart disease is prevalent and severe in Pennsylvania and throughout the states to the north, that it is common in Virginia and the other southern states, but that it is rare in Florida and the West Indies and almost unknown in the equatorial countries.

We now conceive of rheumatism as a generalized disease having its origin in an undetermined infectious agent, or in a dietary, metabolic, or glandular disturbance. When this rheumoidal condition is present it may take an insidious course accompanied only by obscure and fleeting symptoms, or there may be a severe manifestation of a so-called typical syndrome. During the period of childhood the heart is especially susceptible to rheumatic infection, whether the disease appears in an acute form or is latent and obscure. When a definite acute attack of rheumatism occurs accompanied by pain it quickly brings the patient to the attention of a physician and early treatment is instituted. It should be recognized, however, that carditis may be accompanied by mild symptoms, such as "growing" or slight joint pains, a stiff neck, or a light attack of tonsillitis. This is of primary importance because it has been observed that a child with rheumatic infection may not show signs of his disease until symptoms of cardiac insufficiency appear. Some of the most severe types of heart disease we have observed in The Children's Hospital were those in which the symptoms had been either latent or so slight that the child was not seen by a physician until he was suffering from cardiac insufficiency. This fact emphasizes the great importance of early recognition of these latent forms of rheumoidal disease.

It is not uncommon in a large cardiac clinic for one to encounter a certain number of children with congenital heart disease. It has been my observation, and I believe it is a generally accepted fact, that all children with congenital heart disease are potential cases of rheumatic carditis and of subacute bacterial endocarditis.

There is a group of cases in which an incipient acute rheumatic fever runs its course without permanently affecting the myocardium or the valve leaflets. In this group, as a rule, the disease is recognized and early treatment is instituted. In these cases a mild attack of myocarditis subsides without leaving permanent damage or functional disturbances. In the Cardiac Clinic of our Out-Patient Department of The Children's Hospital, we often observe from month to month the gradual return of the heart to its normal size and the frequent early disappearance of murmurs.

There is a second group of patients, however, whose heart muscle is more extensively damaged, resulting in permanent changes. As we examine these children from time to time we find a persistent systolic murmur in the mitral area. Even with this murmur well established, symptoms of cardiac disease may

*From the Georgetown University School of Medicine.
Read by invitation before the annual meeting of the Virginia Pediatric Society, Lynchburg, Va., October 25, 1933.

be entirely absent provided there is no accompanying enlargement of the heart. These patients, unfortunately, seldom reach maturity without recurrent rheumatic infections.

In a third group of cases, changes in the myocardium are sufficiently extensive to produce symptoms of permanent cardiac distress. In certain cases showing physical signs of mitral stenosis and aortic regurgitation, the dilatation alone may be the causative agent producing these murmurs. The mere presence of a double murmur in the mitral or aortic area does not denote structural changes in the valve leaflets. Cases number I and IV of the present series very clearly demonstrate that the myocardium may be extensively involved without an accompanying endocarditis.

In the fourth group, which may be termed the chronic rheumatic group, frequent relapses result in progressive carditis and the development of permanent cardiac insufficiency. This chronic or relapsing type of carditis is one of the most serious and intractable forms with which we have to deal. It leads to permanent and extensive changes in the myocardium, which are first inflammatory and exudative and later fibrotic. Pericarditis, at first inflammatory and exudative and later adhesive, is frequently noted in patients included in this group.

It may be of interest to review briefly a few of the more serious forms of rheumatic heart disease observed at The Children's Hospital.

Case I. (No. 28-3060) — A colored male child, aged 4 years, was admitted to hospital December 17, 1931. His past history revealed that he had had measles, pertussis, and occasional upper respiratory infections. No history of rheumatic infection could be elicited. It was stated that for the past two months the patient had been breathing with difficulty and that for two weeks he had coughed a great deal, vomited, and complained of pain in the epigastrium.

On admission his temperature was 100° F., his radial pulse 110 beats per minute, and his respiration 28 per minute. His blood pressure was 100 mm. systolic and 68 mm. diastolic. He was anemic, had an upper respiratory infection, and appeared acutely ill. A working diagnosis was made of rheumatic heart disease, endocarditis, myocarditis, pericarditis, dilatation, and cardiac insufficiency.

His temperature during hospital residence ranged from 98° F. to 101.4° F., his heart rate from 60 to 160 beats per minute, and his respiration from 20 to 60 per minute. His hemoglobin gradually dropped from 46 per cent to 33 per cent. His red-cell count remained approximately 3,000,000; the leucocytes were between 8,000 and 16,000; and the polymorphonuclears rose from 52 per cent to 62 per cent. Electrocardiograms taken December 30, 1931, January 13, 1932, and February 4, 10, and 24, 1932, revealed tachycardia, auricular and ventricular rates 130 beats per minute, and deep Q waves in lead III, but were otherwise not significant. However, on March 10, two months following admission, an electrocardiogram demonstrated the presence of two-to-one heart block auricular rate 120 and ventricular rate 60 beats per minute (Fig. 1). On the morning of March 16th an electrocardiographic study showed the auricular rate to be 130 beats per minute and the ventricular rate 120 per minute with occasional runs of two-to-one heart block and slight spreading of the P-R interval. The patient died that evening. An autopsy performed by Dr. Janvier W. Lindsey gave the following findings: The heart, which was dilated, measured 11 centimeters transversely and 8.5 centimeters vertically. Several patches of yellowish filmy exudate were found over the anterior portion of the organ. Over the posterior portion of the auricular surface a filmy exudate and a markedly dilated red cord, apparently the coronary vessel, were noted. No pathological condition was observed in the lining of the heart, though there was a suggestion of a fine fibrinous exudate beneath the leaflets and along the edges of the mitral valves. In the micro-

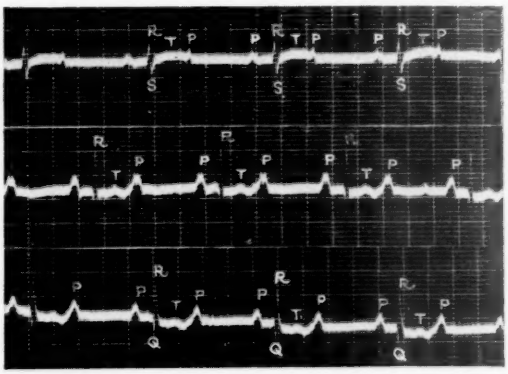


Fig. 1.—Case I. March 10, 1933. Auricular rate 120, ventricular rate 60. P-R interval .20. QRS interval .03. Axis plus 80°. P1, 2 split. 2:1 block.

scopical examination of heart tissue a number of areas were found in which definite cellular infiltration was noted between the muscle fibres, with a consequent distortion of the arrangement of the fibres. These infiltrations were thought to be inflammatory in character. In the muscle tissue approaching the endocardium an extensive inflammtory infiltration was noted, but it was not demonstrated that this inflammtory process produced an actual endocardial exudate, though it was thought to explain the suggestion of exudate along the edges of mitral valve observed on gross examination. The surfaces of the lungs were found to be marked by a number of dark splotches varying from tiny points to extensive irregular areas, most numerous in the right lung. On section, a number of recent areas of infarction were noted. The surface of the kidneys was dark and definitely congested. The capsule stripped readily leaving a smooth surface. On section marked congestion was noted.

Case II. (No. 28-4905)—The following case of rheumatic heart disease is of special interest because of the development of rheumatic nodules prior to the appearance of a distinct syndrome of rheumatic fever. A colored female child, 8 years of age, had a past history of measles, pertussis, and chicken pox. There was no history of tonsillitis or rheumatism; there had been, however, a tonsillectomy and an adenoidectomy in 1930. In May, 1932, small rheumatic nodules first appeared on the child's head and extremities. One month later she had a typical attack of rheumatic fever, with pain and swelling of the joints, elevated temperature, and precordial pain. On July 20, 1932, she was admitted to The Children's Hospital.

On admission her temperature was 99° F., her heart rate 90 beats per minute, and her respiration 20 per minute. There was slight enlargement of the pulmonary conus. A systolic mitral murmur was present which was transmitted to the axilla. A thrill was palpable in the apex. The lungs were clear, the liver was normal in size, and the spleen was not palpable. The hemoglobin was 59 per cent, the red cell count 4,450,000, and the white cell count 10,400, of which 18 per cent were lymphocytes and 82 per cent polymorphonuclears. A working diagnosis of rheumatic heart disease, mitral incompetency, and secondary anemia was made. Numerous moderate-sized rheumatic nodules were present on the skull, the condyles of the radius, and the fingers. A nodule on the radius was excised and on section it presented the histologic appearance of Aschoff bodies. The patient improved under hospital care, and was discharged three weeks after admission with instructions to remain in bed for several months. She was brought to the Cardiac Clinic every two weeks for observation and further instruction in diet and care.

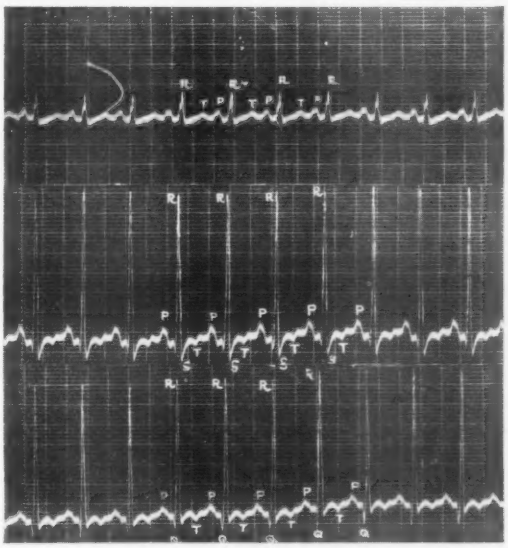


Fig. 2.—Case II. May 12, 1933. Auricular and ventricular rate 130. P-R interval .18. QRS interval .05. Axis plus 84°. R1, 2, 3 split. R1 notched. T2, 3 inverted.

The patient was re-admitted on December 1, 1932, four and a half months after discharge. The temperature was 100° F., and the heart rate 100 beats per minute. The heart was now enlarged in all diameters. A distinct systolic and diastolic murmur was heard in the apex. P_2 was accentuated. The rheumatic nodules formerly noted were still present. Five newly formed ones appeared during the next two days. Those on the skull were from two to four millimeters in diameter. A roentgenogram of the heart taken at six feet standing, December 8th, showed an enlargement of the pulmonary conus and the left ventricle. In an electrocardiogram taken December 5th the heart rate was shown to be 120 per minute, and there was a high take-off of the S-T segment in leads I and II.

The child improved and was discharged on February 2nd. She remained in bed at home except for visits to the Cardiac Clinic. During March she complained of pain in the left

shoulder and the precordium. On April 14th she was hospitalized for the third time. When admitted she had extensive rheumatic nodules on the skull, along the spinal column, and on the extremities. There was moderate edema of the face. The liver was enlarged. Dullness and crepitant rales were present in the bases of both lungs. The heart was enlarged in all diameters. A systolic and diastolic mitral murmur and a systolic aortic murmur were noted. A thrill was elicited at the apex. An electrocardiogram taken May 12, 1933, demonstrated a tachycardia, auricular and ventricular rates 130 per minute, and an inverted T-wave in leads II and III (Fig. 2). The child was discharged on June 22, 1933, unimproved.

Case III. (No. 31-2625)—A colored male child, aged 9 years, was admitted to hospital May 13, 1931. Three years previously he had been confined to bed for a period of two weeks with pain in his joints. Subsequent to this attack he had three similar ones. For a week previous to admission he had been in bed with an elevated temperature, headache, precordial pain, dyspnea, cough, vomiting, and diarrhea. Papular spots resembling measles, it is stated, were scattered over the body. The temperature on admission was 102° F., the heart rate 60 per minute, and the respiration 60 per minute. The heart was found to be enlarged in all diameters. There was a diastolic and a systolic murmur in the mitral area, and a systolic and diastolic murmur in the aortic area. A distinct pericardial friction rub was present. There was dullness and numerous rales noted in the bases of both lungs. The liver was markedly enlarged, and the spleen also was enlarged. A roentgenogram taken at six feet standing, May 19th, showed an enlargement of the cardiac shadow which was interpreted as an evidence of pericardial effusion; however, physical examination demonstrated cardiac dilatation. An electrocardiogram taken May 22nd revealed a two-to-one heart block, the auricles beating at the rate of 160 pulsations per minute and the ventricles at the rate of 80 per minute. The hemoglobin was 48 per cent, the red cell count 3,600,000, and the white cell count 15,400, of which 7 per cent were lymphocytes and 93 per cent polymorphonuclears. The urine contained albumen and hyaline casts. A working diagnosis was made of rheumatic heart disease, acute dilatation, myocarditis, endocarditis, pericarditis, and secondary anemia.

An electrocardiogram taken June 4, 1931, again showed a two-to-one heart block, auricular rate 160 beats per minute and ventricular rate 80 per minute (Fig. 3). Eight days later, June 12th, an electrocardiogram revealed an auricular fibrillation, ventricular rate 100 beats per minute (Fig. 4).

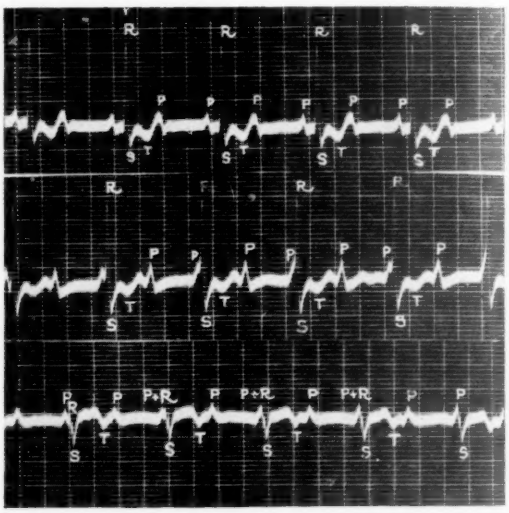


Fig. 3.—Case III. June 4, 1931. Auricular rate 160, ventricular rate 80. Axis plus 20. T1, 2, 3, diphasic. 2:1 block.

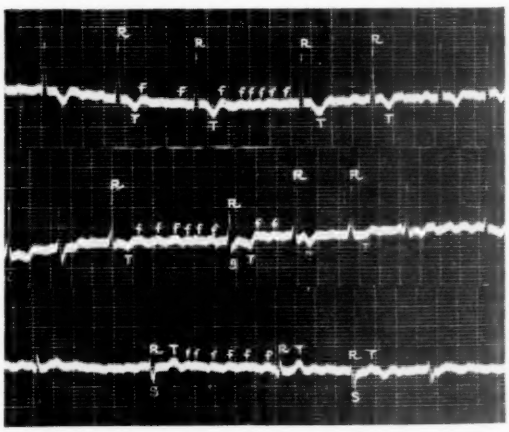


Fig. 4.—Case III. June 12, 1931. Rhythm totally irregular. Ventricular rate 100. Axis plus 10°. T1 inverted. Auricular fibrillation.

During the three months that the patient was hospitalized he was given two transfusions, the first one on June 6th and the second one a week later. Following the transfusions the acute symptoms ameliorated and this improvement continued. On August 10, 1931, he was

discharged as improved, his disease having become quiescent.

On April 14, 1932, a year following his first admission, he was re-admitted because of acute pain in his knees and elbows. His temperature on admission was 104° F., his heart rate 102 per minute, and his respiration 60 per minute. The large vessels of the neck pulsated. The pharynx was hyperemic. The heart was enlarged in all diameters. A systolic and diastolic murmur was present at the apex accompanied by a diastolic rumble. A systolic murmur was also heard over the aortic area. A roentgenogram taken at six feet sitting showed the heart to be dilated. The electrocardiograms showed a deep Q-wave and an inverted T-wave in lead III. The hemoglobin was 49 per cent, the red cell count 3,950,000, and the white cell count 10,700, of which 27 per cent were lymphocytes and 73 per cent polymorphonuclears. The urine contained a large amount of albumen.

During this second period of hospitalization the patient received one blood transfusion and violet light therapy every other day over a period of five weeks. During residence there was slight improvement. The child was discharged on June 12, 1932, two months after admission. One month later he was re-admitted, complaining of dyspnea, edemea of the ankles, and vomiting. The following day he was transferred to Freedman's Colored Hospital, where he remained under treatment for two months. On August 11, 1932, he was discharged improved. On November 17, 1932, he was re-admitted and a diagnosis was made of aortic insufficiency and mitral lesion following rheumatism. The patient died on January 14, 1933, two months after admission.

Case IV. (No. 29-1623)—A colored boy, 11 years of age, was admitted to hospital April 20, 1929, after having had repeated attacks of rheumatism over a period of approximately a year and a half. His temperature on admission was 100.6° F., his heart rate 148 beats per minute, and his respiration 55 per minute. There were dyspnea, cyanosis of the lips, and pitting edema of the lower extremities. The abdomen was distended and tense. The liver was enlarged. Dullness and medium crepitant rales were present at the bases of both lungs. The cardiac sounds were muffled. A systolic and diastolic murmur was heard in the apex. A roentgenogram taken at six feet standing showed cardiac dilatation. The hemoglobin was 69 per cent and the red cell count 4,560,000. The urine was essentially negative. The Wassermann was also negative. A working diagnosis was made of rheumatic heart disease, cardiac dilatation, myocarditis, and endocarditis.

The patient was discharged from hospital November 12, 1929, after a seven months' residence. The systolic and diastolic mitral murmur as well as the systolic aortic murmur persisted. The patient returned to the Cardiac Clinic for periodic examinations. On March 4, 1930, he was again hospitalized. His temperature on admission was 103° F., his heart rate 120 beats per minute, and his respiration 45 per minute. The left thorax, anteriorly, was found to be bulging. The enlargement of the heart and also the systolic and diastolic mitral murmur and the systolic aortic murmur noted in previous examinations remained present. A roentgenogram showed the heart to be unchanged in size. On April 19, 1930, six weeks after admission, the patient was discharged.

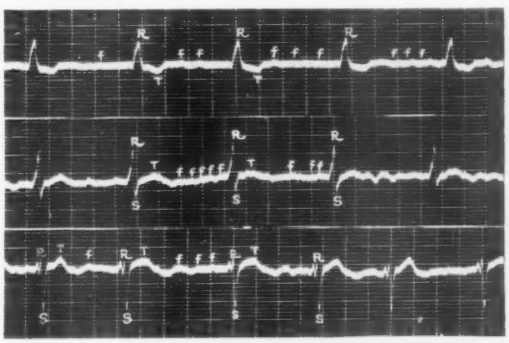


Fig. 5.—Case IV. August 4, 1931. Ventricular rate 70. Axis Minus 50°. Left axis deviation. Auricular fibrillation.

On July 22, 1931, he was admitted to Emergency Hospital because of nausea, vomiting, and marked dyspnea. On admission he was in extreme cardiac distress. His skin was cold and clammy, and there was profuse perspiration of his face, hands, and feet. The forceful action of his heart shook the entire bed. The heart was uniformly enlarged and there was a definite broadening of the aortic arch. The heart rate was approximately 130 beats per minute. At times ventricular extrasystoles were noted. There was a loud systolic and diastolic mitral murmur and a systolic and diastolic aortic murmur. A collapsing pulse was present. The blood pressure was 110 mm.

XUM

systolic and 0 mm. diastolic. The hemoglobin was 75 per cent, the red cell count 4,250,000, and the white cell count 14,600, of which 33 per cent were lymphocytes and 65 per cent polymorphonuclears. The urine contained hyaline and granular casts. A roentgenogram of the heart showed a contour suggestive of mitral stenosis and pericardial effusion. An electrocardiogram taken August 4, 1931, demonstrated auricular fibrillation, ventricular rate 70 beats per minute (Fig. 5). A working diagnosis was made of rheumatic heart disease, mitral stenosis and incompetency, aortic stenosis and incompetency, auricular fibrillation, and cardiac dilatation. On October 30, 1931, the patient developed acute pericarditis, and on November 3, 1931, three and a half months after admission, he died.

An autopsy was performed by Dr. C. G. Aronstein, who recorded that the pericardial sac was found to contain about 300 cubic centimeters of cloudy yellowish-green fluid. Numerous pleuropericardial adhesions were present. The heart was enlarged, grade four, and filled the entire anterior left chest except at the apex. The myocardium was rather soft and inflamed in appearance. The left ventricle was dilated, grade four, and the right ventricle was hypertrophied to about one centimeter in thickness. An anatomical diagnosis was made of rheumatic myocarditis and pericarditis with fibropurulent effusion (right hypertrophy and bilateral dilatation), diffuse bronchopneumonia, severe fatty degeneration of the liver, and multiple splenic bacterial emboli.

It is of interest to note that at autopsy no gross changes were present in the valve leaflets, although during the course of the disease all the recognized physical signs were present of mitral stenosis and incompetency, plus aortic stenosis and incompetency.

Case V. (No. 27-155)—A white female child, six years of age, was admitted to hospital, July 23, 1928. Her temperature on admission was 99.4° F., her heart rate was 168 beats per minute and totally irregular, and her respiration 30 per minute. She gave a past history of having had scarlet fever, alveolar abscesses, and "sore throats." Her heart had been rapid and irregular during the previous two years. A roentgenogram showed the heart to be enlarged 3 per cent. There were no murmurs present. A working diagnosis of tachycardia was made by her attending physician, and the auricular waves in the electrocardiographic tracing which was taken were interpreted as being wandering P-waves. She was discharged, seven days following admission, as improved. Her heart rate however, continued rapid and arrhythmic.

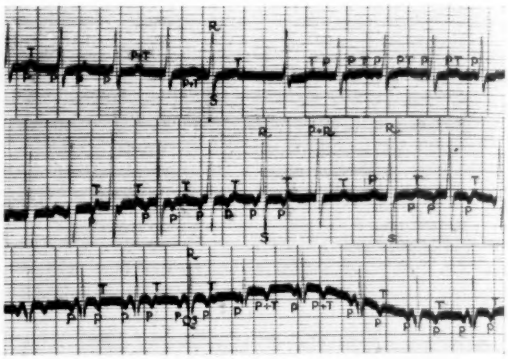


Fig. 6.—Case V. April 27, 1929. Rhythm totally irregular. Auricular rate 210. Ventricular rate 130. Axis plus 60°. Ectopic auricular tachycardia bordering on flutter, with varying block due either to the circus movement in the auricles momentarily taking another course or to the sinus node becoming dominant for a moment.

The patient was admitted to my service on April 8, 1929, ten months subsequent to her first admission, with a recent history of repeated nasal and oral hemorrhages which followed an attack of whooping cough two months previously. The temperature on admission was 101.4° F., the heart rate 130 beats per minute, and the respiration 40 per minute. The heart was slightly enlarged, and its action was arrhythmic. There was a faint systolic murmur heard in the mitral area and the aortic first sound was accentuated. The lungs were clear, the liver was normal in size, and the spleen not enlarged. No edema was present. The hemoglobin was 80 per cent, the red cell count 4,550,000, and the white cell count 17,400, of which 49 per cent were lymphocytes and 51 per cent polymorphonuclears. The urine was essentially negative. The tonsils were hyperemic and cryptic. The blood Wassermann was negative. An electrocardiogram taken April 27, 1929, demonstrated the presence of auricular tachycardia with block (Fig. 6). A working diagnosis was made of rheumatic heart disease, myocarditis, and auricular tachycardia with block. During her residence from April 8, 1929, to July 20, 1929, she was symptomatically treated for her rheumatic carditis, and on one occasion, after the administration of quinidine sulphate, a normal sinus rhythm was established. However, because of

nausea, the drug was discontinued by the resident physician and the arrhythmia became re-established. The patient was discharged July 20, 1929, improved, but the tachycardia with block continued.

After discharge from hospital she was kept quietly at home, was digitalized according to the Eggleston's method, and maintained on a daily dosage of one and one-half grains of the powdered leaf. No change was produced in the arrhythmia. On July 9, 1930, she had a tonsillectomy. She was continued on digitalis, and on August 19, 1930, a regular rhythm was established. Since that period until the present time, December 1, 1933, she has maintained a normal rhythm with the one exception of a few days when she had an acute upper respiratory infection, contracted September 13, 1933. Absolute rest, salicylate of sodium, and digitalis re-established a normal rhythm.

Treatment

Due to the fact that acute carditis in children is almost always secondary to a rheumoidal infection, it is to the latter condition primarily that treatment must be directed.

In the case of an acute attack of rheumoidal disease the possibility of carditis must ever be kept in mind. Treatment by means of sodium salicylate and sodium bicarbonate must be initiated at once and thoroughly carried out. Fifteen grains of sodium salicylate and fifteen grains of sodium bicarbonate, or more, in combination, should be given three times a day after meals. It is desirable and advisable as a prophylactic measure to continue for a time the monthly administration of sodium salicylate and sodium bicarbonate, fifteen grains each, for a period of ten days. Whenever an upper-respiratory infection occurs in a rheumatic child, the salicylate treatment should be initiated immediately. It must be distinctly borne in mind that sodium salicylate administered in large doses may produce acidoses; consequently, when sodium salicylate is being administered in large doses over a long period of time, the symptoms should be closely watched and the urine examined frequently for diacetic acid and acetone. If symptoms of acidosis appear, the discontinuance of the drug for twenty-four or forty-eight hours and the administration of a purgative will usually relieve the condition. Sodium salicylate administered in large doses may cause the red corpuscles to break down rapidly. In the event this occurs, transfusions should be given. In the treatment of the rheumoidal state, absolute rest should be instituted and sufficiently prolonged. When there are definite signs of active carditis, a rest period in bed of six months or longer may, in a first or second attack, restore the normal function of the heart. If the first attack is properly and thoroughly treated a large percentage of cases will make a complete recovery. The thorough treatment of a second attack may also bring good results, but subsequent attacks of rheumatic carditis cannot be treated with any degree of success.

In all cases of rheumatic carditis, infected tonsils and teeth as well as upper respiratory infections should receive appropriate treatment. The removal of carious teeth and infected tonsils is not a cure for rheumoidal conditions, nor will it prevent or minimize future attacks of rheumatic carditis. The procedure is justified, however, because of the improvement in the general health of the child which, it has been observed, frequently follows the removal of a focus of infection. If a tonsillectomy or a dental extraction is decided upon, the procedure should be instituted only after the child's temperature and heart rate have been normal for a month or six weeks, or until it is reasonably certain that the disease has reached an inactive stage. Salicylate of sodium should then be administered three times daily for ten days before interference and for a period of ten days following, as a prophylactic measure.

Pharyngitis in the rheumatic child has, in many instances in my experience, been the forerunner of a renewed attack of carditis. I have repeatedly noted this in the Cardiac Clinic. Every precaution should, therefore, be taken to protect the patient from extreme changes of temperature, from dampness, cold, and draughts. He should also be absolutely isolated from individuals suffering from upper-respiratory infections. Bronchopneumonia is, unfortunately, a frequent accompaniment of rheumatic carditis. The records of The Children's Hospital show that during the past five years 22 per cent of the deaths occurring in cases of acute carditis resulted from bronchopneumonia. Children having acute rheumatic carditis should constantly wear a light woolen undergarment during the winter months as an additional protection.

Secondary anemia is an almost constant ac-

XUM

companiment of active rheumatic carditis. When it is observed that the hemoglobin is 50 per cent or below, I believe that the giving of periodical blood transfusions is indicated. I have noticed a striking improvement following this procedure. Violet-light therapy may also be tried.

The diet should be nourishing, high in carbohydrates, and easily digested. Large feedings are contra-indicated in the active stage of the disease. Frequent feedings should be given and in small amounts. The fluid intake should be restricted when there is retention or edema. In the congestive state of rheumatic heart disease the quantity of fluid intake and of urine excreted should be observed and recorded. The intake should be controlled so that it will not vary too widely from the output. In practice it is believed that the urinary output should not fall below 50 per cent of the fluid intake. My observations lead me to believe that when the quantity of urine excreted is being reduced too far below the intake, the administration of ammonium chloride, in salol-coated capsules, in large enough doses will produce diuresis.

Digitalis therapy, it has been observed, has not always been administered in the present-accepted form or dosage. In my experience very good results have been obtained in selected cases by the use of a standardized powdered leaf of digitalis administered according to the method of Eggleston; that is, 1½ grains given for every ten pounds of body weight, plus 1½ grains per day during the period of digitalization to compensate for the amount eliminated in the twenty-four hour period, after which 1½ grains given daily as a maintenance dose. As occasion arises three grains may safely be administered on alternate days, provided that the dosage is controlled by frequent electrocardiographic readings. The administration of digitalis in sufficient amounts to reduce the heart rate in cases of carditis without considering the Eggleston dosage or frequent observation of the electrocardiographic tracings may prove disappointing. I have observed many cases of heart block in children suffering from acute carditis. It is now generally conceded that children will stand larger doses of digitalis per body weight than will adults. The Eggleston method, however, is only a working basis for the establishment of the patient's optimum dose. I have likewise observed that there is less gastric disturbance with the administration of the powdered leaf in salol-coated capsules. I have had no experience in administering digitalis to a child under four years of age.

In the acute stage of rheumatic carditis with an elevation of temperature, rapid heart action, and the presence of arrhythmias such as changing blocks and extrasystoles, digitalis must be administered with great caution or withheld, even though the accompanying signs and symptoms of cardiac insufficiency are present. In these instances theocalcium and the salicylates are the most useful drugs of selection. It has been my observation that all cases of active rheumatic carditis respond more favorably when treatment is initiated by salicylate therapy and rest rather than by treating the carditis *per se*. All cases of established rheumatic heart disease should, I think, be given rations of salicylate of sodium three times a day over a ten-day period monthly during the autumn, winter, and spring, as a prophylactic measure.

This dictum does not apply, however, to the cardiac patient who has passed the active stage of his disease. When and if the active manifestations of the rheumoidal condition subside and there is still present dilatation, pulmonary congestion, enlargement of the liver, and an absence of changing heart block, digitalis has a rightful place in the treatment. Its use is especially indicated in cases in which auricular fibrillation has developed. It is in these two conditions that digitalis has its greatest value.

Summary

1. Rheumatism is the most frequent cause of heart disease in children.

2. Rheumatic heart disease in its early stages is in many instances accompanied only by mild and fleeting symptoms of rheumatic fever, and then the disease may go unrecognized until signs of cardiac insufficiency appear.

3. When early treatment is instituted and sufficiently prolonged, a mild attack of rheumatic carditis may subside without leaving evidences of permanent damage to the myocardium or functional disturbances.

4. The effective treatment of rheumatic heart disease is the early and thorough treatment of the initial attack with adequate precautions against subsequent attacks.

References

1. Lewis, Thomas: Disease of the Heart. The Macmillan Company, London, 1933, p. 202.

2. White, Paul Dudley: Heart Disease. The Macmillan Company, New York, 1931, pp. 305, 322, 325.

3. Coburn, Alvin F.: The Factor of Infection in the Rheumatic State. The Williams & Wilkins Company, 1931, pp. 74-77.

Washington Medical Building,
1801 *Eye Street.*

CAESAREAN SECTION.*

A. M. Showalter, M. D.,
Christiansburg, Va.

1. *Definition:* The term caesarean section, caesarotomy (and hysterotomy in a limited sense) refer to the removal of the products of conception from the uterus by means of an incision into the uterus through the abdominal or vaginal route.

2. *Derivation of Term:* The term caesarean section is probably a redundancy from "partus caesareus (cedere, to cut) or "caesus e matris utero—" meaning an act of parturition, or *birth* by aid of an incision or cutting.

The theory of Julius Caesar being born this way is not considered authentic, and, in fact, the operation was being done many years before his time, according to historical records.

3. *History:* It seems the operation was first done on a recently dead mother in order to save the life of the child, the Lex Regia of Numa Pompilius, 715 B. C., requiring this operation to be done before burial of a woman who died near term. This law or custom, if not originated by a religious influence, was at least in later years definitly encouraged by religious teachings, in order to baptize the child.

Omitting details of the history of this operation for a number of years, we find in the year 1500 A. D. the first record of this operation being done on a living woman—Jacques Nufer, a swine-gelder of Siegerhausen, Switzerland, operating on his wife by abdominal caesarean section after a dozen midwives and several barbers had failed to deliver her.

The vagueness of historical records is, however, impressed upon our minds when we recall that Felkin in the year 1879 witnessed this operation, in the central part of Uganda, by a native who used banana wine, both as an antiseptic and anesthetic (the patient being well intoxicated from its effects). The abdominal wound was closed with pins and figure of eight stitches and dressed with a paste made of herbs. The patient recovered in eleven days with a maximum temperature of 101° F. How long these natives had been doing this operation and with what success, no one knows.

4. *Indication for Operation:* The question as to when a caesarean section should be done is probably one of the most difficult problems confronting a physician in the general practice of medicine, and, in my opinion, more mistakes are made in arriving at the best conclusion in these cases than anything else we have to decide. From my own personal experience, I conscientiously and sincerely feel that I have made many mistakes trying to deliver a baby by the natural route with artificial aid, but so far have never regretted doing a caesarean section—because of the very splendid results to both mother and baby.

In short, it is my opinion that when the welfare of both mother and baby can be improved by a caesarean section, whatever the indication therefor, then it should be done. If a doubt arises in the opinion of the attending physician, either have a consultant see the case, or advise a caesarean section, as I truly believe less harm is done by caesarean sections, as a general rule, than complicated deliveries by other means.

From 1500 to 1877 A. D., the operation of caesarean section seems to have been done frequently, and with a very high mortality, on account of the fact no effort was made to close the wound in the uterus. Most of the patients died from hemorrhage or infection. In 1877, Porro, of Pavia, in order to avoid dangers of hemorrhage and infection, advised the supravaginal removal of the uterus after the child was delivered, and the stump of the uterus was sutured into the lower angle of the wound. This was a great advance in the operation of caesarean section, and cut down the mortality rate a great deal by preventing hemorrhage and infection.

1882, Sanger developed a technique of operation in which the incision in the uterus was closed with sutures and returned to the ab-

*Read before the Southwestern Virginia Medical Society, at Wytheville, Va., September 15, 1933.

domen or removed, as indicated. This was the *really great* advance in this operation, for, with few modifications or improvements, it is the operation most generally done today, namely, a mid-line incision in abdomen and uterus, delivery of baby, and closure of both wounds with the strictest surgical asepsis that can be obtained.

5. *Comments and Criticisms:* There are two cardinal points in the Sanger operation I desire to discuss—namely, the use of a rubber ligature or tourniquet around the cervix to control hemorrhage and to avoid suturing the decidua. The last of the two seems to have survived to date, and the first, in my experience, the most important, seems to have been discarded. The tourniquet also has been accredited to Litzmann to prevent or combat hemorrhage, but Henry Jellett, of Ireland, says "It is an unnecessary precaution, and is said to interfere with the subsequent contraction of the uterus," and then proceeds to tell how to control hemorrhage by means of an assistant grasping with his hands the lower segment of the uterus, etc.

An experience of twenty-five years with over a hundred cases of caesarean section does not seem quite compatible with the caution embodied in the textbooks of our recognized authorities against the use of the tourniquet and sewing up of the mucosa or decidual lining of the uterus. It has always been our custom to use the tourniquet and also to close the incision in the uterus with a continuous double No. 2 catgut (plain or chromic) including all layers of the uterus, except the peritoneum, which is closed by the same stitch, reversing direction and inserted as a baseball stitch in order to give more perfect approximation, tying one knot at lower end of incision, where the first layer of sutures started. Our results have been so satisfactory that we are glad to report these cases with results.

6. *Report of Cases:* During the past twenty-five years we have operated on approximately one hundred cases, approximately two-thirds of which were term cases. Some of these cases were operated on in their homes, some moved from the operating room to their homes without entering the hospital, and some prior to the year 1922; therefore our records are limited except in seventy-two cases operated on in the New Altamont Hospital from 1922 to July, 1933. We can, however, certify that a number of the cases operated on have subsequently given birth to one or more children, and a few cases have had subsequent operations, including caesarean sections, and in no instance have we observed the presence of adhesions, or any ill results from a weakening of the uterine wall.

Of the seventy-two cases operated on from 1922 to 1933, there was one death, which occurred a few hours after delivery, the patient having been in labor for twenty-four hours. She had four plus albumin and was unconscious on admission; also efforts to deliver by forceps and version had been resorted to without success.

In this group of patients we have included all patients treated by this operation during this period of time in the hospital from whatever source and whatever the indication or condition of the patient, such as contracted pelvis, placenta praevia, eclampsia. The big majority had been in labor for some time, and delivery had been attempted by other means.

Average number of days in the hospital after operation, 13.29 days.

Longest time of any patient, 31 days.

Shortest time of any patient, 5 days, except the one patient that died four hours after admission.

Lowest annual rate, 1933, 10.46 days.

Highest annual rate, 1922, 19 days.

Twenty-five of this group operated on before the period of viability.

In none of the cases was the baby born dead, if alive when operation started; however, some of the babies did die from prematurity or other causes during the first few hours or days in the hospital, but none from the effects of the operation, so far as we can judge.

7. *Technique of Operation:* Anesthetic, local, spinal or general.

Mid-line or right rectus incision, long enough to deliver uterus from abdominal cavity, at which time presenting part of child is lifted from pelvis to permit a ¼ inch rubber tube to be placed around upper cervix, including broad ligaments, but below presenting part. This is drawn tightly and clamped with forceps in mid-line below, and sufficient torsion is made with forceps to control hemorrhage at all stages of operation Next, the abdomen and contents are protected by two towels placed longitudinally and clamped tightly around uterus above and below, while two more towels are placed transversely and clamped tightly around uterus and to fold of broad ligaments

in order to secure further protection against soiling the abdominal cavity or contents. Midline incision in uterus is then made and baby delivered, cord clamped, cut and delivered to nurse. Amount of time necessary for the operation up to this time is about four or five minutes. At this stage the placenta is removed with all membranes of any size, uterus dried out with gauze sponges, and wiped out with wet alcohol sponges. At this time it is usually necessary to tighten the tourniquet just a little to prevent oozing of blood. You now have a clean dry field. The closure of the opening in the uterus, as above outlined, is very quickly done. Exposed part of uterus is now cleansed with alcohol gauze, dried, and tourniquet released, and, if there is no bleeding present, the clamp and towels are removed and uterus returned to abdominal cavity. The abdominal wound is closed in the usual manner. We formerly used pituitrin, 1 c.c., at this stage of the operation, but only use it now as indicated by subsequent uterine inertia, which, thus far, I do not recall we have ever had to do. The speed of recovery and freedom of post-operative complications seems to depend largely on the protection from hemorrhage and shock, and also from soiling the abdominal cavity and contents. Both of these can be almost perfectly controlled by the tourniquet and proper use of towels after delivery of uterus and far better than trying to complete the operation while the uterus is in the abdominal cavity. The control of hemorrhage not only expedites the operation, but enables an operator to take his time, see what he is doing, and, furthermore, helps a great deal in keeping the abdominal cavity clean.

Summary

1. Use of the tourniquet around upper cervix, as recommended by Sanger and Litzmann, expedites operation, protects against hemorrhage and contamination of abdominal contents, and enables the operator to see more clearly what he is doing, thereby making for a quicker and better piece of surgery.

2. Use of tourniquet does not interfere with contraction of uterus, and is free of any damage in our experience.

3. Delivery of uterus enables an operator to better protect the abdominal contents, as above outlined.

4. Closing of mucous membrane or decidua with the continuous stitch, together with other layers of uterus, has no disadvantages in our experience.

5. Closure of peritoneum over incision in uterus with baseball stitch gives more strength and better approximation, thereby reducing probability of adhesions.

CELIAC DISEASE WITH OSTEOMALACIC-LIKE BONE CHANGE.*

Fred J. Wampler, M. D.,
and
J. C. Forbes, Ph. D.,
Richmond, Va.

Celiac disease was first recognized by Gee (1888) who described it as follows:

"There is a kind of chronic indigestion which is met with in persons of all ages, yet is especially apt to affect children between one and five years old. Signs of the disease are yielded by the feces; being loose, not formed, but not watery; more bulky than the food taken would seem to account for; pale in color, as if devoid of bile; yeasty, frothy, an appearance probably due to fermentation; stinking, stench often very great, the food having undergone putrefaction rather than concoction. The pale loose stool looks very much like oatmeal porridge or gruel. The hue is somewhile more yellow, otherwhile more drab.

"The patient wastes more in the limbs than in the face, which often remains plump until death is nigh. In the limbs, emaciation is at first more apparent to hand than to eye, the flesh feeling soft and flabby."

According to Bennett, Hunter and Vaughan (1932) it usually comes on from the ninth to the twenty-fourth month of life, but may not make its appearance until adult life. It is

*From the Departments of Preventive Medicine and Biochemistry, Medical College of Virginia.

Thanks are hereby extended Dr. W. T. Graham and the staff of the Crippled Children's Hospital, Richmond, Va., for referring this case to us for this study. We also wish to thank Dr. Alfred F. Hess for reviewing the findings in the case with us.

XUM

primarily a nutritional disturbance accompanied with diarrhea and sometimes vomiting. The stools usually contain a large per cent of fats and fatty acids. The abdomen is usually distended and enlargement of the colon is generally present. Calcium metabolism is likely to be upset; associated with it may be one or more of the following diseases: tetany, rickets, osteomalacia, and anemia.

The digestion of the fats in the food is most upset, but carbohydrate digestion and absorption is also much impaired. The protein element is taken care of as in a normal person.

Sometimes periods of exacerbations alternate with periods in which the stools are more normal in appearance and constituency. The child, if the condition continues, becomes stunted in growth, and this fact with the stool findings has given rise to the term intestinal infantilism.

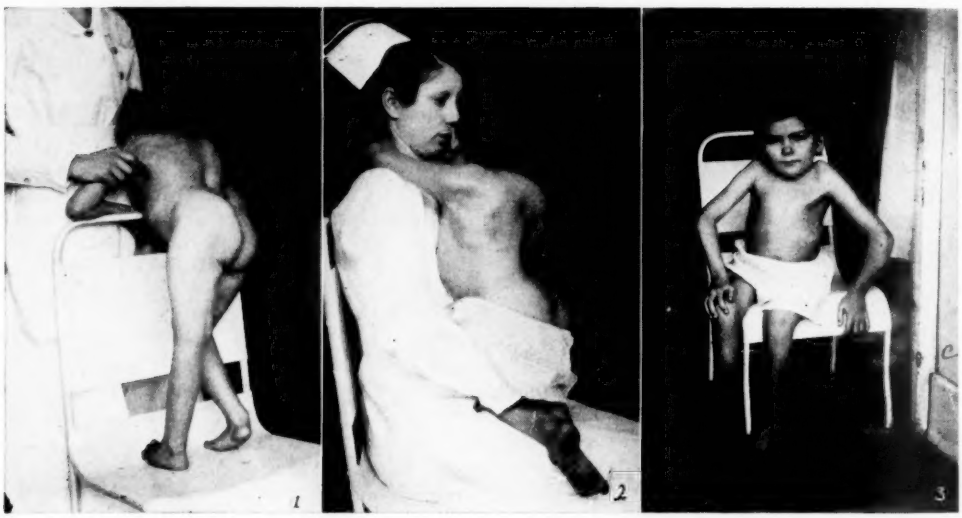


Fig. 1.—Three views of case taken when patient was nearly nine years old. They show: (a) marked shortening of one leg, (b) spinal deformity, (c) chest and ulnae deformities.

The diagnosis can be made from the stool, history, and physical appearance of the patient. Large quantities of fatty acids and soaps in the stool—pale gray color, copious, soft but not watery, frothy, with a marked stench, makes the diagnosis certain. There may or may not be present infantilism and there may or may not be bone deformity.

The writers have recently had come under their observations a case with bone symptoms and deformity much more marked than usually seen in the disease. The bone condition in many respects resembled osteomalacia, although the blood picture was not typical of that disease.

Mattie P., aged eight years and ten months, weighing thirty-two and one-half pounds, was placed in our care in the Dooley Hospital for calcium and phosphorus metabolism check.

Family History:—The father and mother are living and well. The mother was not so well about the time of the birth of this child. The parents are third cousins. There are three brothers and three sisters, all older than Mattie, and all living and well.

Past History:—The child was a full-term baby, weighed ten pounds at birth, and seemed normal and grew normally the first year. After being weaned, she drank about one and one-half pints of milk daily, and though her father reports her bowels inclined to be loose, there seems to have been no marked digestive disturbance. When the child was about a year old, the parents noticed that she was not developing normally. The child's arms began to bow as she pushed herself over the floor and the legs bowed badly as she tried to walk.

When she was six years and ten months old, she was admitted to the Crippled Children's Hospital, Richmond, for study and treatment. X-ray pictures showed moderately severe rickets in some of the epiphyses and much rarefaction of the shafts of some of the bones. Spontaneous fracture of the shafts of

both ulnae, of one tibia, fibula, femur and at least one rib were evident. The diagnosis of rickets was made and the child was put on cod-liver oil, 1 dram t.i.d., viosterol 250 D., 10 M. morning and evening, and ultra-violet light four times a week.

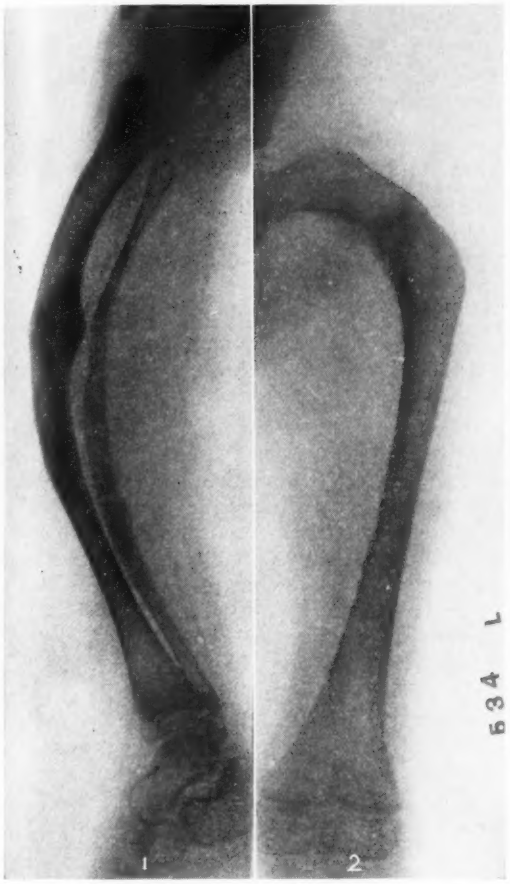


Fig. 2.—X-ray pictures showing marked thinning of shadows of bones. Note thinning of cortex, and fracture without displacement.

Under this treatment the diaphyseal and epiphyseal abnormalities cleared up but the shafts of the bones showed no improvement in the osteoporosis. Osteotomies done on two of the long bones for the purpose of straightening were very slow in healing. One was four months in healing, and the second remained uncalcified at the end of a year. The majority of the spontaneous fractures were unhealed at this time.

The scalp and hair were normal, parietal bosses were prominent, eyes and nose essentially negative, and the teeth were normal in number and constituency. There were no cavities, and only two fillings were present.

Her antero-posterior chest diameter was increased (15 cm.) and the diameter from side to side much decreased (14 cm.). The dorsal spine had a kyphosis and a marked right lateral scoliosis and a deep lumbar lordosis. There was a good coat of tan over the entire body. The neck appeared very short, due to the marked curvature and, therefore, shortening of the spine. The pelvic girdle did not appear abnormal but the pelvis was badly tipped laterally, the left side being higher. Healed fractures of both clavicles at the junction of the outer with the middle thirds left large protusions over the sites. The upper arms were of normal length and contour but each forearm showed an inward and backward bowing, due to fracture of each ulna two inches below the olecranon. The right femur was straight but the left showed a marked anterior-external bowing, which made the corresponding thigh three cms. shorter than the other. The right tibia was bowed forward and inward while the left was comparatively straight. She had no pain, but when pressure was made over the bones badly affected she would flinch, when she would not over more normal bones. Mentally, the child was rated by a psychologist as in the low normal group.

The case resembles osteomalacia in that the fractures were transverse and subperiosteal with angulation but no displacement, the severe osteoporosis of some bones while others appeared normal, and moderate pain over the affected bones. The blood calcium was in the low normal group (9.9 mgs.) and the phosphorus was high (6 mgs.). These blood findings are not usual in osteomalacia—the blood calcium and phosphorus being usually considerably lower in the latter disease (Wampler, 1933).

The case was admitted to the Dooley Hospital for calcium and phosphorus metabolism determinations. The laboratory findings and metabolism experiments are reported in detail in another paper (Wampler and Forbes, 1933). The child was roughly in calcium equilibrium when the tests began; this was brought up to .57 gms. daily retention on medication and diet. Roentgenograms showed some improvement in the calcium in the bones after two or more months with the retention. The child's

strength increased and there was general improvement, but the weight still fluctuated, being as much as two pounds in twenty-four hours on one occasion.

There is a strong suspicion that there is an endocrine element here in addition to the steatorrhea. The X-ray of the sella turcica showed it largely closed over, and there were some symptoms of a para-thyroid condition.

SUMMARY

A case of celiac disease extending over eight years is reported which showed bone changes resembling those seen in more severe cases osteomalacia.

BIBLIOGRAPHY

Bennett, T. I., Hunter, Donald, and Vaughan, J. C.: Idiopathic Steatorrhea (Gee's Disease). *Quarterly Journal of Medicine.* Vol. 25, page 603, October, 1932.

Gee: St. Bartholomew's Hosp. Reports, xxxiv (1888), p. 17.

Wampler, Fred J.: Osteomalacia. *Virginia Medical Monthly,* Vol. 59, February, 1933, p. 647.

Wampler, Fred J., and Forbes, J. C.: Calcium and Phosphorus Metabolism in a Case of Celiac Disease. *Southern Medical Journal,* Vol. xxvi, June, 1933, p. 555.

PAROXYSMAL HEMOGLOBINURIA OF SYPHILITIC ORIGIN.*

E. R. MOORMAN, M. D.,
Kilmarnock, Va.

HISTORY OF SYPHILIS

There are two opposing views concerning the antiquity of syphilis. One is that the disease was introduced into the civilized world in relatively recent times by the returning sailors of Columbus, and that it was spread throughout Italy in 1493 by the soldiers of Charles VIII. It was about this time that the disease became a great scourge and spread rapidly over Europe.

The other view is that syphilis is a very ancient disease which has existed among civilized people since the very dawn of history. Early Egyptian and Assyrian inscriptions, as well as the bony changes found in mummies, are cited as documents in evidence. It is even said that Chinese medical treaties written more than twenty centuries before the Christian era contain direct reference to the disease. According to this view, the great epidemics of syphilis which occurred during the Middle Ages were mere recrudesences of an already endemic disease. The latter view seems the more probable.

The syphilis of the Middle Ages was virulent and widespread. Its rapid propagation at this time was effected by various modes of personal contact, and its venereal origin was not generally recognized. Later syphilis came to be regarded solely as a venereal disease; but the hard chancre, soft chancre or chancroid, and gonorrhea were not distinguished for a long time. They were finally differentiated by Ricord about the middle of the nineteenth century.

Then there came the middle of the nineteenth century when syphilis was studied largely in its dermatological aspects. Although the dermatologists of that day, Ricord, Hebra, Fournier, and others, understood the general character of the infection, the graphic appearance on the skin and mucous membranes seemed in their minds to dominate the clinical picture and to give the disease special dermatological interest.

In the early part of the twentieth century the conception of syphilis was greatly broadened and the disease gradually assumed a different clinical aspect. Experimental study was facilitated by the discovery of Metchnikoff and Roux that syphilis can be transmitted by inoculation to the lower animals. In 1905 Schaudinn made the epoch making discovery of the causative agent, the Treponema pallidum. About a year later Wassermann devised the biological reaction of great diagnostic value to which his name has been given. In 1910, Ehrlich, in his studies in chemotherapy, succeeded in producing the highly potent remedy salvarsan. Finally, in 1913, the much discussed question of parasyphilitic disease was settled by Noguchi when he demonstrated the constant presence of the Treponema in the brain of paretics. As the result of these discoveries, syphilis is today considered neither a venereal disease nor a skin disease, but a general disease with protean manifestations.

*Read before the Northern Neck Medical Association, Heathsville, Va., May 25, 1933.

Syphilis, as we are learning almost daily, manifests itself in many different ways, and as Sir William Osler once said, "know syphilis in all of its manifestations and all other things will be added unto you," the veracity of which assertion certainly cannot be doubted.

Probably one of the most peculiar manifestations of syphilis and certainly one of the most rare is that of paroxysmal hemoglobinuria.

Paroxysmal hemoglobinuria is usually defined as a syndrome or condition of late acquired or congenital syphilis, manifesting itself by recurring paroxysms of hemoglobinuria and by characteristic symptoms. The blood of patients who suffer from this condition contain in the latent form a specific hemolysin which becomes active when the blood is chilled and which produces the paroxysm. The condition may occur at any age, but it is rarely observed in patients more than fifty years old. It is as common in children as in adults, the majority of patients being male.

The autohemolysin may, when the patient is exposed to cold, hemolyze enough erythrocytes to produce transient hemoglobinemia, hemoglobinuria, secondary anemia, evidence of altered bile metabolism and a typical group of symptoms.

This condition, paroxysmal hemoglobinuria, should not be confused with hematuria produced by drugs, sulphonal or trional poisoning, nor hemoglobinuria from other causes, such as malaria, bacillary fever, septicemia, Raynaud's disease, Winckle's epidemic hemoglobinuria of the newborn, and various hemolytic poisons, particularly carbon monoxide, carbon bisulphide and arseniureted hydrogen.

This rare disease, paroxysmal hemoglobinuria, is characterized by the occurrence of paroxysm of hemoglobinemia and hemoglobinuria, often following exposure to cold or occasionally after exertion, in a patient with syphilis. Constitutional symptoms, such as a chill, fever, malaise, headache and aching pains in the back, abdomen or legs may or may not accompany the paroxysm.

The blood serum of these sensitive individuals contains an autohemolysin which unites with the erythrocytes at low temperature, and, when the blood is warmed, intravascular hemolysis occurs and free hemoglobin is liberated into the circulation. If the destruction of the erythrocytes has been sufficient, hemoglobinuria occurs, the urine becomes tinged with color varying from a like pink to a dark Burgundy red, with methemoglobin, oxyhemoglobin and hematin. Occasionally the urinary findings indicate the occurrence of an acute renal tubular degeneration. The urine between the attacks is normal; during the paroxysms, deep red, urine, due to methemoglobin, oxyhemoglobin and partly to hematin, is the characteristic finding.

In most cases a few casts, erythrocytes and variable amounts of albumin are found. The erythrocytes decrease rapidly during a paroxysm; in severe attacks they may be reduced as much as one million per c.m. of blood in a few hours. Repeated attacks may produce secondary anemia.

The autohemolysin is the thing which differentiates paroxysmal hemoglobinuria from all other diseases. It differs from all other known hemolytic agencies.

The most acceptable theory explaining its presence is that the autohemolysin in one of the anti-bodies or immune bodies produced in response to the antigen liberated from the spirochetes of syphilitic organs or both. The autohemolysin is found only in syphilitics.

Urinary findings are frequency of urination, dyspnea, oliguria, or palpitation.

It has been shown that approximately one-sixtieth of all the erythrocytes of the blood must be hemolyzed to raise the plasma hemoglobin to the renal threshold for hemoglobin excretion.

The symptoms are rare. They appear following exposure to cold of varying degrees, especially if the patient is tired and somewhat exhausted. The typical systemic symptoms are chilliness, headache, malaise, and aching pains in the back, legs or abdomen; more rarely dizziness, visual disturbances, nausea and a desire to yawn are noted. The paroxysm is usually ushered in with a chill, the temperature rises to perhaps 101-103 degrees F., and the systolic and diastolic blood pressure may be elevated 50-100 m.m. of Hg. After probably thirty minutes there will be an urgent desire to urinate. The urine, which contains free hemoglobin, will be dark red, reddish brown, or almost black. As a rule it is because of the dark urine that the patient consults the physician. The paroxysm usually lasts from two to four hours, though occasionally for twenty-four hours or longer. The patient will ordinarily void the dark urine in the first two specimens after the chill. The

temperature falls, recovery is complete, and there are no symptoms between attacks.

The autohemolysin responsible for paroxysmal hemoglobinuria may be demonstrated by a process known as the Landsteiner reaction. In its best form, the reaction consists in chilling to zero C. for ten minutes the patient's serum and a suspension of his own washed erythrocytes to which fresh complement has been added, and then warming them to 37 degrees C., when hemolysis occurs. The above reaction is brought about by a union of the hemolysin and erythrocytes at low temperature. The blood serum of normal individuals does not contain these hemolysins.

So far as reported, cases show there is no evidence that the paroxysmal hemoglobinuria occurs in other than syphilitic patients of long standing, and while the condition occurs at times in warm weather, it occurs far more commonly in cold weather following a chill.

Thurman reported a case of artificially produced paroxysmal hemoglobinuria by immersing the feet of a syphilitic patient in ice cold water for thirty minutes, after which the patient is put to bed and kept warm; shortly afterwards she had a chill, passed bloody colored urine which, before chilling of her feet, was perfectly normal.

Paroxysmal hemoglobinuria, as stated in the beginning of this paper, is a rare and rather strange manifestation of syphilis. However, it has been known since 1794, when Stewart, at Archangel, observed the condition. A similar case was discussed by Royer in his Treatise on Diseases of the Kidneys in 1841. Dressler, in 1854, in his monogram on Intermittent Albuminuria and Chromaturia, first gave a satisfactory account of the condition.

In 1885, Ehrlich made some study of the condition and showed that when a ligatured finger of a hemoglobinuric patient was immersed in ice cold water intense hemolysis occurred below the ligature in the finger.

Most authors agree that the presence of a special autolysin in the blood serum of patients with paroxysmal hemoglobinuria is the result of the action of the syphilitic virus.

Blumer, in his recently issued textbook on Bedside Diagnosis, said plainly, it is now known that this disease, paroxysmal hemoglobinuria, is due to syphilis.

As early as 1874 it was observed that in cases of syphilis the erythrocytes diminished and the leukocytes increased. Frequently with a sudden drop in the total white cell count and the percentage of polymorphonuclear cells with a subsequent leukocytosis, there is an elevation of blood pressure and a rise in temperature. Intensive anti-luetic treatment may be expected to cause cessation of the symptoms, disappearance of the auto-hemolysins, and a conversion of a positive to a negative Wassermann.

Later investigators, such as Konried, found that the hemoglobin content of the corpuscle was attacked by the syphilitic virus. Marri was one of the first to connect syphilis clearly with paroxysmal hemoglobinuria and to institute antisyphilitic treatment.

No evidence of a spontaneous cure can be found in the literature, but under antisyphilitic treatment the symptoms of the disease disappear. A hemolysin is present in the blood plasma of these individuals, which is activated by a change in temperature, particularly by exposure to cold and then to room temperature. A hemoglobinemia is produced in the patient and the hemoglobin passes through the kidneys, giving to the urine the reddish transparent color characteristic of hemoglobinuria.

As stated in the beginning of this paper, the condition, paroxysmal hemoglobinuria, is extremely rare. In 1928 Mackenzie reviewed the literature on the subject, stating there had been less than three hundred cases reported. Indications of the rarity of this unusual manifestation of syphilis is further borne out by Pilot and Friedmann, who reviewed the case records of 156,000 syphilitic patients treated at the Massachusetts General Hospital during the past thirty years, and reported that they found only nine cases of paroxysmal hemoglobinuria. Likewise, among 74,186 consecutive admissions at the Peter Bent Brigham Hospital there have been but three cases of this disease. Of 3,368 syphilitic patients treated at the Boston City Hospital, only one case of paroxysmal hemoglobinuria was found, this case being the first in which the condition was recognized in twenty years.

Prognosis.—Paroxysmal hemoglobinuria is not considered very fatal, although there is a record of one death during a paroxysm. The attacks may be sufficiently frequent and severe to produce marked clinical anemia.

Antisyphilitic treatment will generally control the attacks. There have been no authenticated spontaneous cures.

Treatment.—It is generally accepted that a cure can be obtained by vigorous and prolonged antisyphilitic therapy with arsphenamine, iodides, mercury and bismuth.

Diagnosis.—1. A history of passing a dark red urine following exposure to cold, together with the characteristic prodromal paroxysms and post-paroxysmal prodromal symptoms.

2. Demonstration of free hemoglobin in the urine during the attacks.

3. Absence of hemoglobinuria between attacks.

4. A positive Wassermann or other diagnostic evidence of late syphilis.

The case which I wish to report in this paper was first seen in my office May 16, 1932.

Patient, a white male, age 38, occupation, a seaman, weighing 165 pounds, apparently robust and hearty. Chief complaint was (1) chilly sensations after exposure to severe cold, (2) palpitation of heart, (3) passing bloody urine upon exposure to severe cold.

Past History: Has had the usual infectious diseases of childhood without any known complications. General health is said to have been good. History of sore on penis fifteen years ago.

Present Illness: Patient states that for the past four or five years he has been particularly susceptible to severe cold weather, in spite of the fact that he wears quite heavy clothing. Quite often after being exposed to severe cold weather he has a chill; within a few hours he has an urgent desire to urinate, during which time he voids dark reddish colored urine for several subsequent urinations, after which the urine becomes clear. He stated that this would not occur again until he is exposed to severe cold; then he goes through the same experience. According to the statement of the patient, the attacks have gotten progressively worse, but at no time has he had one of them during warm weather.

Patient gave history of having had a sore on his penis about fifteen years ago, at which time he consulted a physician who examined him, took a Wassermann, and informed him that he had syphilis. Following this, he received several injections of what he thought was antiluetic treatment in the vein, during which time the ulcer cleared up on his penis. Shortly thereafter he was told by the physician that he was well and need not take any further treatment.

At no time has the patient, according to his statement, had any skin lesions, but he says he has had vague somatic pains in his legs and palpitation of the heart quite frequently; he has also complained quite frequently of being nervous.

There is no family history of syphilis, and both mother and father are living and well. Patient is the only child of the parents, and has been married about eleven years. His wife has had no pregnancies, or abortions. She has persistently maintained a negative Wassermann and enjoyed good health.

Physical Examination: Reveals a well nourished and developed white male patient about 40 years old.

Head and neck: Essentially negative.

Thorax: Well developed, expansion free and equal, no rales and no abnormal breath sounds.

Heart: Practically normal in size and position; blood pressure 135/90; no murmurs or abnormal sounds elicited. Aortic second is slightly accentuated; apex beat 80 per minute.

Abdomen: Grossly—negative.

Extremities: Show no limitation of motion, or abnormalities.

Reflexes: Deep reflexes are rather sluggish; negative Babinski and Romberg. Pupils show fair accomodation to light and distance.

Urinalysis: Negative.

Blood: R. B. C. 4,500,000, W. B. C. 9,000, hemoglobin 80 per cent, Wassermann 4 plus.

Upon repeated examinations of the urine there have been no pathological findings only in the specimens taken during or immediately after a paroxysm. These specimens have generally shown a few R. B. C., variable amounts of albumin, free hemoglobin and some few pus cells, the urine being of a dark reddish color.

On July 6, 1932, this patient was put on antisyphilitic treatment, weekly doses of neoarsphenamine in .3 gram doses, increased gradually to .6 grams. After ten injections a Wassermann was taken and reported complete fixation. He was then put on mixed treatment for one month, after which he was put on Iodobismitol for ten injections, at the end of which time a second Wassermann was taken and reported 4 plus. On December 7th, he was started on a second series of Iodobismitol, alternating every third injection with neoarsphenamine. Third Wassermann was taken with complete fixation February 7th, but up until this time the patient had not had any paroxysms, though he had been exposed to some very cold weather.

XUM

On March 1st, he was started on a second series of neoarsphenamine, one day previous to which he had had a paroxysm and passed the bloody colored urine—with the characteristic findings, free hemoglobin, few R. B. C. and a considerable amount of albumin. Blood pressure at this time was 100/60; R. B. C. was 3,200,000, white count 7,500. Ten injections of neoarsphenamine were given during this series and he still maintains a 4 plus Wassermann. However, he had only one paroxysm during the past winter, previous to which he had been having several severe ones each winter.

On May 8th, he was started on a second series of Iodobismitol, alternating with neoarsphenamine and potassium iodide by mouth. He is under treatment at the present time.

Since the beginning of treatment about one year ago the patient has had sixteen injections of neoarsphenamine and twenty-four of Iodobismitol, and still has a 4 plus Wassermann. However, his clinical symptoms have practically cleared up, and says he feels fine. Having had only one paroxysm during the past winter, he expects to continue his treatment.

We have reported here what I believe to be a case of paroxysmal hemoglobinuria, based on the following facts and findings:

1. A history of passing a dark red urine following exposure to cold, together with the characteristic prodromal paroxysms and post-paroxysmal prodromal symptoms.
2. Demonstration of free hemoglobin in the urine during the attacks.
3. Absence of hemoglobinuria between attacks.
4. A positive Wassermann, which has remained positive in spite of the fact that he has received rather vigorous antisyphilitic therapy.

UNDULANT FEVER.*

DEWEY DAVIS, M. D.,
Richmond, Va.
and
HERMAN BAILEY, M. D.,
Sandston, Va.

Undulant fever is a specific infectious disease caused by a member of the bacterial genus, Brucella. In this section of the country the abortus variety is the causative organism in the great majority of the cases. The disease has many synonyms of which Malta fever is the best known. Under the latter name it has been recognized for many years about the Mediterranean basin, and there is caused by the Melitensis variety of Brucella which has been proved to be transmitted by the drinking of raw goat's milk. In 1905, Craig reported a case of Malta fever in Washington, D. C., the origin of which was not known. About 1911, a number of cases were reported from the goat raising section of southwestern United States. In 1924, Keefer described in detail a case originating in Maryland and due to the abortus variety of the organism. Since that time reports of cases have come from all sections of the United States, from Canada and many foreign countries.

In Virginia, Dr. J. Powell Williams, of Richmond positively identified two cases of undulant fever in 1927. The Virginia State Board of Health had three proven cases reported in 1928, and since that time the incidence has gradually increased to thirty-seven in 1932. The cases have been more numerous where the dairy population is heavy, and rare through Southside Virginia where large herds are uncommon. The largest incidence has been in the valley and northern sections of the state.

The Brucella abortus organism is the common cause of infectious abortion in cattle, and it is probable that human beings contract the disease by drinking the infected milk of these animals or by coming in contact with their flesh or their excreta. The milk transmission is doubted by some writers who cite the fact that a large number of individuals drink milk containing the organisms without becoming

*Read before the one hundred and nineteenth session of the Southside Virginia Medical Association, at Emporia, Va., September 12, 1933.

infected. Furthermore, virulent organisms have been added to milk which was consumed by volunteers without resulting in the development of the disease. All the members of the families of two of our patients used the same milk but did not become ill. However, the evidence that Brucella melitensis is transmitted by goat's milk is thoroughly convincing, and it would seem that cow's milk is a logical vehicle for the abortus variety. The explanation must lie in the virulence of the organism ingested and the susceptibility of the individual.

In addition to cattle, the disease may be transmitted by other animals, notably swine. By special agglutination technique, bovine and porcine strains of the organism may be differentiated, and there is some suggestion in the literature that the latter type is more virulent for human beings. The probable portal of entry is through the gastro-intestinal tract, although entrance through a cut in the skin or possibly the unbroken skin cannot be denied.

The following cases have come under our observation:

Case 1.—Mr. O., age 34. His home is in Richmond, but he travels over the entire state as a salesman and drinks considerable milk. He was referred by his physician for diagnostic study October 31, 1932. His past history was unimportant. His present illness began abruptly with what was diagnosed influenza on January 29, 1932. He had fever for about a week, associated with severe sweats. His fever cleared up and he returned to work but continued to have night sweats for at least three weeks. These then ceased but he felt weak and listless. Two months later his fever and sweats returned, so that he again went to bed for two weeks. At this time he was carefully studied and no cause could be found for his symptoms. He weighed 200 pounds, hb. 83 per cent, wbc. 6,700, with slight relative lymphocytosis. His periods of fever and sweats returned at long intervals until he was seen by us.

At the time of examination he weighed 190 pounds and did not appear ill. The only physical abnormality was a slightly enlarged spleen. Blood showed hb. 74 per cent, erythrocytes 3,800,000, leucocytes 6,600, with 52 per cent lymphocytes in the differential picture.

A specimen of blood sent to the laboratory of the State Board of Health showed agglutination of Brucella abortus in dilutions up to 1-160. Blood culture remained sterile until discarded after fourteen days.

He was given an iron preparation which caused a prompt rise in his hemoglobin but he had at intervals periods of mild fever and sweating. On November 28, 1932, a stock undulant fever vaccine became available and he was given this in increasing dosage over a period of six weeks. At this time his agglutination titer was 1-40. On February 7, 1933, he expressed himself as feeling well and has remained so.

Case 2.—Mr. H., age 30. He lives just east of Richmond and has been accustomed to drinking raw milk from a local dairy. When first seen April 17, 1933, he stated that during January, 1933, he felt listless and badly. About February 1st, he developed frequent chills, fever and sweats extending over a period of several weeks. He then improved until a relapse occurred about the first of April. When seen April 17th, he was having fever as high as 105°, chills and sweats. He complained of headache and backache. His spleen was palpable and specimen of blood submitted to the State Laboratory showed agglutination of Brucella abortus in dilutions up to 1-320. The blood culture was positive for this organism. He was given five injections of stock undulant fever vaccine and by May 8th his symptoms subsided. A milder relapse occurred about the middle of May and during this he was given six doses of autogenous vaccine. Since June 4th he has remained well. Blood submitted for agglutination test September 9th was positive in dilutions up to 1-80.

Case 3.—Mrs. B., age 31. She lives four miles east of Richmond and used raw milk from a local dairy. Her onset was rather sudden with a chill on March 25, 1933. She had a chill every other day for ten days, each time with fever and sweating. Her chills then became irregular in time. On April 3rd, leucocytes 5,400, differential showed 50 per cent lymphocytes. Malarial smear negative. Her blood serum agglutinated Brucella abortus in dilutions up to 1-320. She then ran an irregular course with fever for several days and then short periods of improvement. Was given six doses of stock undulant fever vaccine, and then three small doses of vaccine from Case 2 with marked local and general reactions. On June 10th, she developed pain and sore-

XUM

ness in the lower right abdomen, suggesting local inflammation about the appendix, right tube or ovary, and was admitted to the Johnston-Willis Hospital for observation. Blood showed hb. 70 per cent, erythrocytes 4,320,000, leucocytes 4,000, polymorphonuclears 53 per cent, lymphocytes 47 per cent. Blood serum agglutinated Brucella abortus in dilutions up to 1-320. The condition in her abdomen subsided and she went home June 16th. Since then she has gradually improved and about August 1st considered herself well. On September 6th, patient's blood serum showed negative agglutination with Brucella abortus.

The four most striking clinical features of the disease are the indefinite character of the symptoms, the undulant type of fever curve which, however, is not constant, the severe sweats and the peculiar lack of discomfort on the part of the patient even though the fever is high.

The date of onset is frequently indefinite, with gradually increasing malaise, headache, sweating and rise of temperature. On the other hand, the onset may be abrupt and characterized by frequent chills, high fever and profuse sweats. This period of high fever may last a few days or weeks, then subside to recur in a few days or weeks. The fever curve has been likened to that of typhoid fever with several relapses. The appearance of the patient is quite in contrast, however, to the typhoid state. One of our patients while being observed in the hospital was quite vivacious, would entertain her friends or read a novel while her fever was around 102°.

As time passes each relapse becomes less severe until the patient recovers. The average duration is about three months, although it has been described as lasting from a few weeks to two years or more. Cases have also been reported that have never been sufficiently ill to require bed treatment and are classed as ambulatory. The mortality is given as from 2 to 13 per cent. The cases reported in Virginia have shown an 8 per cent mortality.

About the only physical changes found in these cases are an enlarged spleen in about one-third, a moderate loss of weight, and at times a mild bronchitis. Complications are rare. Involvement of the scrotal contents in the male and the pelvic organs in the female have been described. Case 3 above had a short attack suggesting inflammation about the right tube or ovary. Occasionally a definite lymphadenitis occurs. Arthritis has been described by some authors as a common symptom or complication. In Hardy's report of 125 cases, joint pains were fairly common but true arthritis was unusual. None of our cases had more than occasional arthralgia.

Laboratory examinations show a slight anemia, usually leucopenia with a tendency to relative lymphocytosis, and, as diagnostic findings, a positive blood culture and a positive agglutination test, using patient's blood serum. No criterion for level of agglutination in dilutions can be established. At the Hygienic Laboratory at Washington, agglutination in 1:80 dilution, or higher, is considered indicative of undulant fever in the presence of clinical symptoms, but cases have been reported showing positive blood cultures with much lower agglutination titers. The agglutinins usually persist in the patient's blood for some time after recovery, but it has not been established as to whether one attack confers immunity.

In the few cases where post-mortem examinations have been made, pathological findings have been indefinite. The liver and spleen may be enlarged, there is usually some congestion of the lung bases, scattered lymph nodes may be inflamed, and local involvement in the heart and meninges has been demonstrated. In cows there is inflammation of the pregnant uterus and the foetal membranes, and microscopic evidence of inflammation in the mammary glands.

The prognosis as regards life is good, but the duration of the infection is always uncertain and cannot be predicted.

The prophylaxis of undulant fever is important. The ideal would be the elimination of all animals shown to have a positive blood agglutination test, but this is not as yet practicable. Pasteurization of milk from all animals not proven free of infection should be done. It will still be difficult, however, to combat the contact infection of meat handlers.

Curative therapy is quite unsatisfactory. Rest in bed during the febrile periods, a highly nourishing diet to sustain the patient, and remedies for symptoms as they arise are indicated. Vaccines, both stock and autogenous, have been used with uncertain results. One observer has remarked that in the presence of a septicemia due to Brucella organisms he could not see the logic of inject-

ing dead ones to act as antigen. One of our cases showed a distinct drop in agglutination titer after taking the stock vaccine. Intravenous injections of mercurochrome and other antiseptics have been tried with apparently brilliant results in the hands of some, and none in others. We debated the question of giving transfusion of blood or convalescent serum from Case 1 to Case 3, but could not get agreement from the two parties concerned. The very nature of undulant fever makes evaluation of treatment extremely difficult, since the relapses differ in severity and the duration is so variable. It is a disease where the last doctor in the case so often gets credit by the laity for the cure of the condition. If we are only "undulant fever conscious," we will make more early diagnoses and can relieve uncertainty and mental distress on the part of the patients and their families.

MODERN METHODS OF BIRTH CONTROL.*

W. M. Bowman, M. D.,
Petersburg, Va.

The opportunity to present this very important and far reaching subject to this Society is greatly appreciated and it is hoped that the information given will clarify certain phases and prove of value as well.

The subject as a whole was read before the Medical Society of Virginia at Roanoke in October, 1931. At the meeting of this Society held at Lawrenceville, Va., in February, 1932, a paper was read on the "Indications for Contraception." Now we are to consider the modern methods of birth control. After all, this is what we are most interested in, yet it seems that it is the least understood. It is difficult to proceed with any phase of birth control without a brief amplification at least. Several of the very important topics connected with this subject will have to be omitted and others can only be mentioned.

The term "birth control," as commonly called, is otherwise known as contraception, prevenception, prophylaxis of conception, etc. The general meaning as used by its advocates does not necessarily imply "prevention"; on the other hand, it is the proper spacing or the conscious control of the birth-rate by tested, modern, scientific measures. It is desirous that families be as large as possible within reasonable limits of health, financies, eugenical fitness, and other considerations. The idea, then, is certainly not one of preventing families.

Contraception has an entirely different meaning from abortion. It would seem almost ridiculous to have to stress this distinction, and, after all, there is some excuse for the laity in confusing the terms, but not for the medical profession. Personal knowledge, however, has shown that we do confuse the terms. Abortion destroys the already fertilized ovum or interferes with its development, while contraception prevents the union of the two cells, thereby preventing conception from taking place.

Contraception is a medical problem, first and foremost, and it is the doctors who should use it. It is the doctors who must eliminate the unfit and build a wise and vigorous race. The lay leaders of this now world-wide movement are most anxious that the medical profession handle the problem, even though we have watched from the side-line in the past as they have carried on and developed a branch of preventive medicine destined to become a part of our national health program and dealing with vital problems and preventing unnecessary waste of human life and energy. We have marked time long enough, but now we must begin to take a hand and bring this weapon of great power where it rightfully belongs—to the medical profession.

Whatever you may think of birth control, it is not difficult to enumerate the conditions that demand this help, for they are to be found in the experience of all medical men regardless of type of practice. Are we to allow this country to continue to lose 20,000 mothers and 150,000 infants each year, a loss directly or indirectly caused by ignorance of birth control? Are we to stand by with folded arms with knowledge of the fact that there has been a notorious increase in the number of abortions in this country, estimated conservatively to be over a million a year, and resulting in a large percentage of deaths? We all know of men

*Read before the Post-Graduate Medical Society, at Petersburg, Va., October 17, 1933.

XUM

long out of work, a wife and several children to support, probably babies to arrive or just arrived. If the so-called "white collar" class finds it necessary, because of economic conditions and a desire to maintain a high standard of living, to limit their families, what must be the condition existing among the unskilled laborers? Reliable contraceptive information should be made easily accessible to these unfortunates in the interest of their families and society. Are we apathetic because we are afraid of the words "social and economic grounds" for birth control advice? The sterilization laws now in effect in the several states are simply the application of humane and intelligent control to human breeding which is destined to bring about a marked improvement in the race from a eugenical standpoint at least. Have you stopped to consider a study of the situation in the United States which revealed the fact that the feebleminded and generally biologically unfit class are increasing about three times as fast as the best human stock? Are we headed for universal insanity? This condition is a most serious threat to mankind and immediate action is necessary. Universal sterilization (permanent protection) of the feebleminded, epileptic, and the like should be made a law and thus check this deplorable condition. Instead of an immense life of low type, would you not prefer half that amount of a higher type? Surely it cannot be numbers that you really want. Why is it necessary that the human race increase rapidly, anyhow? Is China with its many millions any happier than little Holland? You have recently seen the course Japan was forced to follow because of its over-population. The same must inevitably happen to other countries under the same conditions. During pregnancy we do all we can to keep the woman in good health and condition in order that she may give birth to a healthy off-spring and to preserve her health; therefore, conversely, why should we not defer a pregnancy or control it when conditions are unfavorable for procreation Is not reliable contraceptive advice more to be desired than infanticides, abortions and the other evils that exist due to ignorance of birth control? Women should be more than just a breeder of children. Only the capitalist, with his hunger for profits, and the war-lord, with his hunger for man power, now cry out: "Give us more people, for upon their backs we ride to glory."

It is an established proposition that all species of plant or animal life, if allowed to multiply unchecked, would in a relatively short time overrun the entire surface of the globe. This you well know and will perhaps recall, for examples, the eggs of a single codfish, the seed of a plant, or the possible multiplicity of off-springs resulting from mating a single pair of guinea pigs. This unhampered reproduction of species would soon consume the total quantity of matter contained in our solar system. In reality, of course, we know this does not take place, since nature has provided its forces of destruction to maintain a balance. The human race is also subject to this same law of multiplication. Populations have been known to double in twenty-five years, and under favorable conditions may do so in half that time. Population pressure and the counter pressure of antagonistic forces are requisite to maintain a balance of our population. These forces consist of human destruction by wars, epidemics, periodical famines, floods, etc. Death, it might be said was an adaptation advantageous to the race, and might be regarded as a provision against over-population. With the gradual elimination and improvement in these factors, the pressure of population has shown a corresponding increase. We must here take into consideration perhaps the most important check of all on over-population, and that is: the conscious effort to keep the number of newly born individuals within tolerable limits. The earliest method resorted to by primitive peoples was, naturally enough, infanticide, or the killing of infants at birth or shortly afterwards. We find this method to some extent still prevailing in many parts of the globe. It seemed not only a convenient means of regulating the growth of population, but also to determine its quality, for usually only the weaker infants were put to death. Partly supplanting infanticide, there existed licentiousness, homosexuality, and prostitution.

It is not known exactly just how long infanticide continued before it dawned upon the primitive mind that it could be avoided by destroying the infant's life while still in utero. Infanticide was henceforth gradually replaced by artificial abortion. At first, this was resorted to during the later stages of pregnancy, and when man began to recognize early pregnancy efforts were made to interrupt it. Although abortion was better than infanticide, the former carried with it a waste of human

life, suffering, and economic losses. The substitution of abortion for infanticide, however, must be considered chronologically and ethically a step in advance. As time went on and man desired to prevent pregnancy altogether, humanity finally witnessed a new departure in dealing with over-population, namely, contraception. This was known and occasionally employed in antiquity, as may be gathered by reading the 38th chapter of Genesis, 8th, 9th, and 10th verses. In modern terms, Onan sought to guard against conception by practicing coitus interruptus. Erroneously, however, his name has become associated with masturbation ("onanism"). The real movement for control of procreation may be said to date from Malthus' famous "Essay on Population" (1798). The remedy proposed was "self-control" or abstinence and there were many followers. This method was obviously bound to fail in time because of the powerful influence of the reproductive instinct. Complete restraint among married couples living together is entirely unnatural.

With the justified need of a more rational means of control desired, laboratory and clinical research really got under way. Although the ideal method has not been reached, the methods commonly employed at present in the various birth control clinics here and abroad are vastly superior to those frequently used by the laity and often advised by the profession. The Russians have been experimenting with a collapsible ball, but they are apparently not having the success anticipated. The serum method tested at the University of Edinburgh will take years to demonstrate its value as a contraceptive. For protection prolonged over weeks or months, arrest of manufacture of eggs or sperms is being studied, the chief means being heat to the testicles, hormones, spermatoxins, or X-ray. For permanent protection, the seminal duct above the testicle is tied harmlessly under local anesthesia, or the oviduct is closed; also sterilization by X-ray is under continued test.

The contraceptive methods usually employed today may be broadly divided into two classes: chemical and mechanical. To the former belong such methods as douches, suppositories, tablets, powders, and jellies; to the latter, condoms, sponges, tampons, intra-uterine pessaries, and in a sense coitus interruptus.

Of the chemical methods most commonly employed are douches and suppositories. Neither have proven satisfactory contraceptive measures. With the douche, various clinics report only 20 per cent success and with suppositories, 40 per cent. If chemical contraceptives are to be used, they can be employed to a greater advantage and with much greater chances of success in the form of jellies. The jelly that is most frequently used is, perhaps, the lactic acid form and results have shown it to be successful in about 80 per cent of the cases.

The most important of the mechanical methods are the intra-uterine pessary, the condom, and the occlusive pessaries. Coitus interruptus may be included in this group. Suffice it to say that the intra-uterine pessary can only be condemned. It is neither reliable nor physiologically s o u n d. Coitus interruptus also is not an efficient method; yet there is world-wide continuance in this practice. It is not reliable and is physiologically and psychologically unsound. Many urologists and sexologists claim that coitus interruptus leads to various urological, sexual, and psychic disturbances. The condom is the most commonly employed contraceptive method of the mechanical devices. It maintains its place in Europe and America as the device which is the chief reliance of the public and the one which stands first in availability. The fifteen manufacturers in this country are reported to produce 1,400,000 a day. When carefully tested and properly applied, the condom is a reliable means of contraception, yet we find frequent failures with its use. It might surprise you to know that recent reports from the various clinics show that the success obtained with its use gave only 30 per cent protection. As an additional precaution in using the condum it is advisable to apply a small amount of an approved antiseptic jelly on the outside of the sheath and inside at the bottom. Aside from the question of reliability, however, there are objections to the use of the condom on physiologic and psychologic grounds. Any one doing contraceptive work will soon find these objections sustained.

The occlusive pessary method has been in use abroad, especially in Holland and England for many years, and has come into general use in America during the past few years. There are two types of occlusive pessaries, the cervical and the vaginal. The cervical are

XUM

designed to fit snugly around the cervix. To this group belong the popularly used Mizpah pessary, the French pessary, and the Pro-race or Check pessary of Marie Stopes. In selected cases very satisfactory results have been obtained with these pessaries. The chief objections to them, however, are that they can be adjusted only with great difficulty, and that many women cannot acquire the necessary skill to do so. The vaginal diaphragm occlusive pessary has proven to be more satisfactory than any of those mentioned. This pessary consists of a rubber dome with a covered metal spring around its circumference and resembles half of a tennis ball. It is designed to fit diagonally across the vault of the vagina from a point in the posterior cul-de-sac to a point behind the symphysis pubis and makes gentle but firm pressure against the vaginal walls. It serves as a barrier between the sperms and the os uteri yet there is no attempt to cap the cervix. There are several varieties of these pessaries, differing in the kind of rubber and type of spring used. They may be obtained in sizes from 50 to 105 mm. in diameter with a 5 mm. difference in each size. The fitting set, composed of sizes 65, 70, 75, and 80 is used by the physician to determine the size required in each case and the largest pessary that can be comfortably used should be chosen. It is obvious, therefore, that each patient must receive a thorough gynecological examination. Certain pathological conditions may be present and thus interfere with a proper fitting. These conditions should be corrected if possible. A possible pregnancy should always be kept in mind and if in doubt, especially in a case where the period is overdue, it is well to explain the situation to the patient so that the blame will not be laid to the pessary if a previous early pregnancy really existed. While some women are claiming good results with the use of the pessary alone, it is advisable that it be used in conjunction with the jelly. This combined method is the one of choice and is giving 96 per cent success throughout the various clinics. In private practice there is no reason why a higher percentage should not be obtained approximating 100 per cent. The method is a temporary one, the pessary being removed within a few hours after intercourse. The patient is taught within a few minutes at the office how to insert and remove the pessary. This method is not only reliable but physiologically permissible, psychologically satisfactory, requires the least preparation commensurate with complete protection, is the simplest devised giving adequate protection, and is absolutely harmless. No one has yet been able to bring forward any clinical evidence that this type of pessary, properly fitted by a physician, correctly used and cared for, has ever injured any woman in any respect whatsoever.

For the majority of patients the vaginal diaphragm pessary is applicable. Patients in whom it cannot be effectively used are those in which the perineum is greatly relaxed, those who are obese and have short fingers, thereby making insertion difficult, and in newly married women during the first months of marriage. In those cases with cystocele or prolapse a special shaped pessary (Matrisalus) may be obtained. In other cases unsuited for a pessary it is necessary that the next best method be chosen after a careful consideration.

It is hoped and urged that physicians will continue to acquire and discuss scientific, effective, contraceptive methods, so that they will be in a position to really consider the problems presented to them as they would any other medical condition. Do not tell the woman with a dangerous heart lesion or a mother exhausted and weakened by repeated pregnancies, nursings, etc., that under no circumstances must she become pregnant,—and then refuse or fail to give adequate preventive advice. How can a physician excuse himself for neglect of ordinary health protection? Motherhood is such a beautiful, noble, and worthy undertaking that it should be voluntary and intelligent, and not accidental and promiscuous regardless of conditions or the evil results that might follow.

It is further urged that physicians aid the National Committee on Federal Legislation for Birth Control to abolish or amend the antiquated Federal Laws that still exist excluding supplies and medical literature relating to birth control from the United States mails, by giving their individual support and conveying this matter to their medical societies for consideration.

101 *Liberty Street.*

AN ANALYSIS OF 298 CASES OF OPERATIONS ON THE GALL-BLADDER WITH CONCLUSIONS AS TO OPERATIVE PROCEDURE.*

WADE H. ST. CLAIR, M. D.,
Bluefield, W. Va.

The subject of this report is the surgical treatment of gall-bladder disease at the Bluefield Sanitarium covering the period from January 1, 1920, to May 1, 1933. The total number of cases was 298. Three operations in the series were excisions after drainage within the period covered, and the actual number of patients was 295.

The incidence of age and sex was not unusual. The youngest patient was a girl of eighteen, who had a calculous gall-bladder. The oldest was sixty-nine. Women constituted 81 per cent of the series and represented 243 cases. There were fifty-five cases in men, or 19 per cent. Seventy-eight per cent of the women had been pregnant.

Calculi were found in 219 cases and constituted 73 per cent. Associated stones in the common duct occurred fourteen times. In one case calculi were present in the common duct but absent in an old contracted gall-bladder, and in still another instance stones had reformed or been overlooked in the common duct where there had been gall-bladder excision elsewhere a year previously. Seventy-seven cases, or 26 per cent. were non-calculous gall-bladders.

The seventy-seven non-calculous gall-bladders have been further classified as to the degree and variety of pathology found. The pathology in twenty-four cases was thus designated as gross. The previous clinical evidence of disease was glaring. The gall-bladder which has been previously drained, regardless of what the provocation may have been, is a type of its own and accounted for six cases. Seven cases were designated "strawberry" gall-bladders. Eight cases had a clinical history of definite recurring attacks of biliary colic, but operation disclosed no departure from the normal. Thirty cases, which may be looked upon as the real problems of gall-bladder disease, had less certain clinical evidence of disease and revealed at operation rather ill-defined pathology. There were two cases of carcinoma, which are of statistical interest only.

In the non-calculous cases the appendix was noted as normal twenty-four times, diseased in twenty instances, and had been removed already in sixteen cases. There was no notation made about the appendix in the remaining seventeen cases. Routine removal was done forty-one times along with the operative treatment of the gall-bladder condition.

Cholecystectomy was the usual operative procedure and was done alone 272 times and combined with operations on the common duct in another ten cases, constituting, therefore, as a single and combined procedure, 95 per cent of surgical effort. Simple drainage was done ten times and "ideal" cholecystotomy once. Exploration and drainage of the peritoneal cavity was done in a single case for rupture of the gall-bladder and simple abdominal exploration for carcinoma twice. There was a single case of removal of stones from the common duct following a previous gall-bladder excision. One case of duct reconstruction was done successfully in a patient operated on by us prior to the period of this series and in whom the common duct was damaged in a simple excision of the gall-bladder, being followed by persisting fistula and intense jaundice whenever the fistulous tract became closed.

In the total series eight patients died, which represented an operative mortality of 2.7 per cent. Of late years we have made something of a fetish of making every gall-bladder operation an interval case, and in the early part of our series, when we were less well sold on the wisdom of this practice, we can account for two deaths which, under the present more conservative practice, may have been avoided. One of these cases, a woman weighing 180 pounds and age forty, was hardly over acute symptoms when excision of a calculous gall-bladder with edema of its walls was done. We were also enthusiastic at the time about excision and closure without a drain and this practice carried out in this case may have contributed to a fatal outcome. The patient died five days after operation probably from infection. A second case was that of a woman, fifty-two years old and also a stout stocky person, who had a calculous gall-bladder with

*Read before the Clinch Valley Medical Society at Tazewell, Va., September 30, 1933.

walls infiltrated to the thickness of from one-quarter to one-half inch. She was showing little tendency to clear up on a tentative plan and simple drainage was resorted to. The patient died of apparent shock two days after operation.

A third case with operation undertaken in an acute stage was that of a woman twenty years old with operation directed at a high acute appendix rather than a gall-bladder. A calculous acute gall-bladder was encountered. The patient did not do well from the start, developing intractable vomiting early, delirium and convulsions later, and died twelve days after operation. Clinically no chest complication developed, and a partial autopsy showed no peritonitis or any intra-abdominal condition to cause death.

The most interesting problem in the series of deaths was the case of a man forty-one years old who, with a previous history of mild gall-stone colic, entered the hospital with an attack hanging on for twenty hours and with no signs of letting up. With a decided drop in blood pressure and other evidence of shock, exploration was made for an acute pancreatitis. Blood stained peritoneal fluid, areas of fat necrosis and a swollen and edematous pancreas confirmed the suspected diagnosis of acute pancreatitis. Numerous small punctures were made in the edematous pancreas, stones were removed from the gall-bladder, and a simple drainage was done. The patient made satisfactory progress for a couple of weeks and then developed a duodenal fistual from which he died forty-four days after the operation.

The four remaining deaths were of no special interest and followed frank post-operative pneumonias. In one instance the chest complication was obviously a metastatic septic process and there was an associated empyema. In another case autopsy showed an inflammatory mass about the pancreas head, which had been responsible for a severe post-operative jaundice, and the pneumonia, put down as one of the immediate causes of death, was probably a terminal event.

The more conservative practice in late years, already referred to, of tiding all cases over any acute process, has lengthened the stay in hospital, so that the average period of hospitalization in this series is twenty-two days. The pre-operative care took up an average of four days and the post-operative period was eighteen days. In 1923 we reported a series of 100 consecutive operations[1] in which the average hospitalization period was sixteen days. In the last five or six years we have handled a considerable number of patients on a periodic payment plan, and this fact has, no doubt, contributed to some extent to the longer stay of twenty-two days. The quiescent case now, after no other preparation than food and forced fluids for twenty-four hours, may submit readily to operation at once, but in any case with any sort of acute process, we have developed the practice of waiting almost indefinitely for a clear interval.

This review of 298 operations on the gall-bladder and its passages recalls many cases which evidently impressed at the time certain principles, although as individual cases they had been forgotten. The whole series has accentuated anew facts which should always be evident and has emphasized phases of surgical procedure which experience over many years has proved expedient.

Diagnosis must be reasonably accurate and not slip-shod. In the usual case this is always easy and certain. The attack of biliary colic is ordinarily so characteristic that a diagnostic problem does not exist. Acute processes produce local phenomena which have to be differentiated from a rupturing or ruptured peptic ulcer, sometimes an ill-placed and atypical acute appendix, rarely an acute pancreatitis, and now and then coronary heart disease expressing itself in abdominal angina. Common sense and average judgment are ordinarily adequate. In the more quiescent case with less glaring expression of disease, the Graham test of X-ray visualization of the gall-bladder is of undoubted value, although this diagnostic adjunct, itself not uniformly certain in the interpretation of a normal or a diseased gall-bladder, must be subsidiary to the long and recognized practice of the dependence upon a clinical story properly evaluated and objective evidence obtained by the examiner.

Operative findings ordinarily must represent pathology commensurate with the clinical picture, although now and then, as will be referred to later, surgical treatment must be directed purely at the relief of symptoms. We look upon the incidence of calculi in 73 per cent of the series as representing a rather conservative practice in the selection of all operative cases. While constituting by no means

the sole evidence of disease, the presence of stones makes its existence at least certain and not speculative. Although much depends on whether excision is practiced early or delayed to such a time when serious damage may have followed the extension of infection beyond the gall-bladder, adequate surgical treatment of calculous gall-bladder is most successful.

Logically not necessarily the case, but in practice usually so, any gross failure to obtain satisfactory end-results generally must seek an explanation in a more strict accounting of the pathology in the non-calculous case.

In twenty-four cases of the seventy-seven non-calculous gall-bladders in this series there was gross pathology of a kind as to leave no doubt about positive and serious disease. As stated before, the clinical evidence of disease was glaring. End-results are as satisfactory as in the calculous case.

Another group constituting undoubted pathology is made up of the cases, six non-calculous gall-bladders in this series, on whom cholecystostomy was practiced either as an operation of necessity or as a choice over removal. This type of case fortunately is becoming rare as conservative measures are practiced and as primary excision is more universally done. Mann, of the Mayo Clinic, not necessarily thinking of this phase of the problem, has suggested that the gall-bladder is a temperamental organ. Whatever operative finding may have prompted the primary operation of drainage, experience teaches pretty conclusively that trouble may follow, and where symptoms have recurred or developed after such operative effort, secondary excision usually effects a cure.

"Cholesterosis" or so-called "strawberry" gall-bladder makes up a widely varying proportion of non-calculous cases. Whether representing primary disease in the gall-bladder or a bi-product of metabolic change, excision in a definite case is fair assurance of a relief of symptoms. The fact must not be lost sight of that the normal mucous lining of the gall-bladder, easily by a stretch of imagination, may resemble somewhat the surface of a raspberry or strawberry and may account for a large incidence of this type of pathological gall-bladder in some series. In the seven cases listed as such in this series, the exposed mucous lining was required to possess the reddish base and the prominent papillae with tips containing whitish lipoid deposit to the extent that a non-medical person would recognize at once the resemblance to the surface of a ripe strawberry.

A group of eight cases with histories of clear-cut biliary colic but exhibiting no pathological change at operation emphasizes the importance, even though in rare instances, of operating for symptoms only. It is undoubtedly the experience in any clinic with close observation that now and then a patient presents the perfect clinical picture of gall-bladder disease as expressed by recurring attacks of colic, and yet at operation no departure from normal is found. It is fortunate that excision has become a practice in such cases, for a clinical cure is almost certain to follow. These interesting cases are classified at the Mayo Clinic as cholecystic disease, and Judd,[2] on the basis of certain experimental tests producing characteristic cholecystitis after the intraveous administration of certain chemicals, has suggested the causative factor as probably some change in blood chemistry the nature of which we are not aware. We are certainly not sure of what has taken place in these cases, and for the present surgery is purely an empirical practice.

Thirty cases out of the seventy-seven non-calculous gall-bladders, or 10 per cent of the whole series, revealed at operation rather poorly defined pathology. The changes are variously designated as pericystic adhesions, distended viscus emptying with difficulty, palpable glands; frequently changes in the liver were noted and designated as hepatitis. The clinical evidence of disease was usually as uncertain as the pathology revealed, and the patients complained of upper abdominal pain and rarely of colic. Invaliding digestive disturbance rather than the discomfort of outspoken pain brought them to surgical consultation. In a former report,[1] already referred to, on 100 consecutive cases of gall-bladder disease, twelve cases were of this type, and in a follow-up as to end-results, six were improved to some extent, and six others were probably worse off than before operation. Some of the cases are true cholecystitis and are undoubtedly benefited by removal of the gall-bladder. Still others represent changes in the liver, primary or secondary, and operation is rarely of any benefit. A varying proportion were never gall-bladder cases and belonged to the gastro-

XUM

enterologist rather than the surgeon. This group certainly represents the unsolved problem of biliary disease and the surgical attempt at relief.

There is hardly a question of the choice of operative procedure. With perfected technic and average skill, excision is comparatively safe and carries with it a shorter convalescence and in every way less morbidity. The end-results are ordinarily good in 85 or 90 per cent of a series, whereas in simple drainage symptoms may expect to persist or recur in 40 per cent of cases so treated. In this series, for instance, six cases had excision where formerly drainage was done, whereas only one excision case came to operation later for a condition which the original operation did not forestall (stones reforming or overlooked in the common duct). While cholecystostomy is still recognized practice, it should be resorted to only in operations of necessity where the emergency permits of the least operative effort. Practically all of our surgery on the gall-bladder was done under gas-ether anesthesia. Spinal anesthesia undoubtedly offers some very decided advantages.

Probably the most impressive lesson in surgery of the gall-bladder is that which teaches never to operate for an acute process in or about the gall-bladder except under the most imperative circumstances. It is a rare thing that a case is lost by postponing operation, but it is very probable that many deaths have followed operations undertaken in an acute process or before the disease is sufficiently quiescent. The gall-bladder is so situated that it is early walled off from the general peritoneal cavity, and it is certainly the rare exception that the most acute process will not go over to a safe operative interval. In this connection, an outstanding surgeon[3] has aptly said that surgery has been made safe for the patient and now the patient must be made safe for surgery.

TABLE I

SURGERY OF THE GALL-BLADDER (JANUARY 1, 1920, TO MAY 1, 1933)

Statistical Data

Total number of cases	298
Males (19%)	55
Females (81%)	243
Youngest patient	18
Oldest patient	69
Average age	39

78% of the women had had one or more pregnancies.

TABLE II

SURGERY OF THE GALL-BLADDER (JANUARY 1, 1920, TO MAY 1, 1933)

Incidence of Calculi

Total number of cases	298
Calculous gall-bladder (73%)	219
Associated calculi in common duct	14
Stones in common duct only	2
Non-calculous gall-bladders (26%)	77

TABLE III

SURGERY OF THE GALL-BLADDER (JANUARY 1, 1920, TO MAY 1, 1933)

Analysis of Non-Calculous Cases

Total number of cases	77
1. Pathology-gross (gangrene, empyema, thick infiltrated walls, acute distended, rupture, one stricture, common duct, etc.)	24
2. Previous cholecystostomy and pathology admitted	6
3. So-called "strawberry" gall-bladder	7
4. Less well defined pathology (peri-cystic adhesions, distended viscus emptying with difficulty, palpable glands, etc.) Only one in this series had definite biliary colic	30
5. No gross pathology, but history of characteristic biliary colic	8
6. Carcinoma	2

Normal appendix removed 21 times, diseased appendix removed 20 times, normal appendix left 3 times, appendix previously removed 17, and no record appendix in 16 cases.

TABLE IV

SURGERY OF THE GALL-BLADDER (JANUARY 1, 1920, TO MAY 1, 1933)

Operative Procedure

Total number of cases	298
Simple cholecystectomy	272
Cholecystectomy and drainage common duct	10
Removal stones from common duct only	2
Cholecystostomy	10
Ideal cholecystotomy	1
Exploration and drainage	1
Exploration (carcinoma)	1
Duct reconstruction	1
Deaths	8
Mortality rate	2.7%

TABLE V

SURGERY OF THE GALL-BLADDER (JANUARY 1, 1920, TO MAY 1, 1933)

Analysis of Hospitalization

Data based on the last 236 cases of the series of 298

Average days pre-operative treatment	4
Average days post-operative care	18
Average stay in hospital	22

REFERENCES

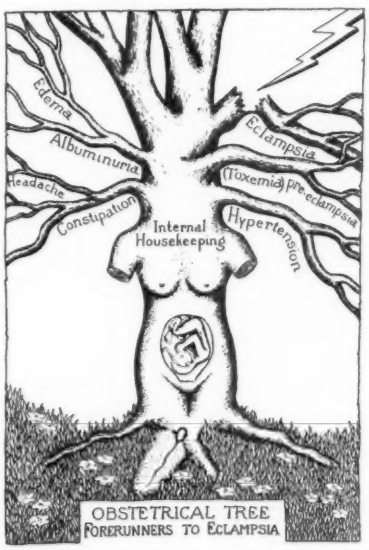
1. St. Clair, W. H., and Rogers, R. O.: Some Further Observations on Surgery of the Gall-Bladder, together with an Analysis of 100 Consecutive Operations, *West Virginia Medical Journal*, Vol. XVIII, No. 4.
2. Judd, Edward Starr: Complications in Gall-Bladder Operations, Proceedings Interstate Post-Graduate Medical Association of North America, 1930.
3. Haggard, W. D.: Diseases of the Gall-Bladder, Proceedings Interstate Post-Graduate Medical Association of North America, 1930.

TREATMENT OF ECLAMPSIA.*

JOSEPH BEAR, M. D.,
Richmond, Va.

Therapeutic approach of this dreaded obstetrical complication falls under two divisions —prophylactic and curative.

The prevention is in many ways more important than its actual cure and is identical with that recommended for pre-eclamptic toxemia. This is true, because, after the condition makes its appearance, pathological lesions have already gained a foothold. The particular scope covers the entire broad field of the conduct of the hygiene of pregnancy—prenatal care. Every physician should be thoroughly familiar with this phase of obstetrics and attach a more rigid importance than heretofore and demand a hearty support and cooperation of his patient. The necessity of regular and frequent examinations of urine, blood pressure readings, weighing of patient and appropriate calcium dietary plan cannot be over-emphasized. The sphygmomanometer is somewhat like a barometer. To a sea captain the reading of the barometer indicates



storms or fair weather ahead. To the obstetrician a blood pressure reading indicates easy or labored cardiac action, and elevation of pressure may give evidence of an impending toxemia. It may represent the "red-light" danger signal.

It is said that lightning never strikes twice in the same place; but disease does—it falls on prepared ground. The forerunners of eclampsia should be fraught with much danger, but can be largely prevented by rigid prophylaxis.

In the above diagram (obstetrical tree) I have attempted to show the forerunners of eclampsia. The spermatozoön is implanted, followed by pregnancy with its associated metabolic changes. When the physiological process becomes pathological, the tree (patient) becomes stunted in its growth, the branches droop and lightning tends to strike the vital parts, causing disaster, often destruction.

The mortality from eclampsia may be reduced two-thirds by early recognition and treatment of pre-eclamptic toxemia.

If the objective in ante-natal care is only to minimize the occurrence of eclampsia it will be worth the while.

Recently, beneficial effects of calcium therapy in hepatic toxemias and eclampsia have been reported.

Since the true etiology of eclampsia is unknown, our treatment must be placed upon an empirical foundation.

There are two general groups, one advocating radical and the other conservative methods, and each possessing certain merits. The radical group subscribes to the belief that since eclampsia occurs only in connection with pregnancy and the convulsions usually cease when the uterus is emptied, the logical way to treat the condition is to terminate pregnancy. The conservative advocates believe that this is unnecessary and is usually harmful. However, it is very evident that the strong tendency today is toward conservatism.

The treatment may be divided into four great plans: sedative; measures to reduce blood pressure; eliminative; and operative. Results are much better in a hospital than in a home. The patient should be isolated in a quiet semi-dark room and active measures promptly instituted. A nurse should be in constant attendance until the acute storm has subsided. This is extremely important, as the patient's life may depend upon the nurse's conscientious

*Read before the Richmond Academy of Medicine, May 9, 1933.

and intelligent attention to the minute details of the prescribed instructions given by the physician. If comatose, the patient is placed on her side so that mucus can escape from the mouth. False teeth should be removed. To avoid the biting of the tongue, a large wooden clothes-pin may be wrapped in a thin handkerchief or gauze and placed between the jaws.

No one can secure the best possible results by becoming fanatically attached to a single plan of treatment; no two patients are exactly alike and frequently certain modifications or added steps must be made to suit the individual case. The general aims which underlie the conservative methods are: an attempt to reduce the toxicity or lessen the nervous irritability, or both. Veit was the first to advocate the use of morphia. Since its introduction many methods have been outlined. A modification of Stroganoff's plan, as employed at Johns Hopkins Hospital and which has been productive of encouraging results, is as follows:

Immediately upon admission, patient is given ¼ gr. morphia by hypodermic; she should be catheterized, then bled for 200 c.c under nitrous oxide anesthesia if conscious. Venesection is done only when it is necessary to obtain a blood specimen for research work. Water should be given freely when conscious; if patient cannot drink on account of coma, the intravenous administration of 500 c.c. of 5 per cent glucose solution should be considered. Too much stress cannot be laid upon attempting to feed an unscious patient, as aspiration pneumonia may occur as a puerperal complication. Delivery should not be done until cervix is fully dilated; then, by the simplest operative means, unless spontaneous delivery seems certain.

One hour after admission—If comatose. give 30 grs. chloral in 100 c.c. milk per rectum. If conscious give by mouth.

Two hours after admission—¼ gr. morphia by hypodermic.

Seven hours after admission—30 gr. chloral, as above.

Thirteen hours after admission—22½ gr. chloral, as above.

Twenty-one hours after admission—22½ gr. chloral, as above.

In giving morphine, the writer uses ¼ gr. every two hours until the respirations range between ten and twelve per minute. Chloral is not administered routinely, fearing the toxic action of the drug. No chloroform is used because of its tendency to increase the liver necrosis incidental to the condition.

During the past few years, Lazard, Dorsett, Dieckmann and others have reported noteworthy results following the intravenous injection of 20 c.c. of a 10 per cent solution of magnesium sulphate every hour or two until convulsions cease. No other medication is used. Lazard reported 103 cases with a mortality of 13.5 per cent. He suggests that a solution of calcium chloride be on hand for intravenous use as an antidote, in the event toxic symptoms develop. Calcium ion is stimulating and is, therefore, a physiological rather than a chemical antidote. It is absolutely essential that the magnesium sulphate should be chemically pure and the solution sterile. At present, properly prepared solutions are available in ampoules and the element of doubt is thus removed. This drug when administered serves as a valuable agent for the control of convulsions in eclampsia. It greatly shortens the stage of coma, lowers maternal mortality, and to a certain degree the fetal mortality.

The newer preparations, luminal, sodium amytal, nembutal, and pernocton, according to some observers, have replaced morphine to a great extent and likewise reduced the general mortality. Sodium bromide proves a valuable adjunct in the sedative treatment, and is best given per rectum.

According to McPherson, venesection is done if the systolic blood pressure is over 175. About 500 c.c. of blood may be withdrawn. It is best not to permit too much bleeding for there may be a considerable loss of blood at the time of delivery and shock may ensue. On the other hand, if no venesection has been performed it is advisable to allow the patient to bleed just a little rather than check, since bleeding is one of the adjuvant means of readjustment. Lichtenstein, of Leipzig, depends entirely upon venesection.

Mention may be made of the Tweedy method at the Rotunda Hospital, in Dublin, in which elimination is stressed. He gives no food, employs gastric and bowel lavage with large amounts of sodium bicarbonate; has the patient lie on her side with foot of bed elevated, and uses only small doses of morphia.

Other measures which are helpful are catharsis and diaphoresis to produce elimination. Either croton oil, Epsom salts or castor oil may be used when gastric lavage is employed, or, perhaps, for better results, two

minims of croton oil in a dram of olive oil may be given orally. If sweating is resorted to, better results follow when the patient is placed under a portable sweat cabinet and subjected to a steam bath, than from the older plan of using the blankets. During the past few years these measures have not proved of any real value. An objection raised against packs and sweats is that they concentrate the toxins in the blood, thus increasing irritation to the nerve centers while the amount of poison eliminated through the skin remains negligible.

Water can be administered either by proctoclysis, hypodermoclysis or intravenously. Titus recommends hypertonic glucose solutions intravenously—not with the fixed purpose of furnishing fluids as for the effect of the glucose on liver regeneration. He strongly urges that the prevalent under-dosage be avoided, and glucose in sufficient concentration (25 per cent) be given to produce a full therapeutic effect. Thalhimer believes detoxication of the patient occurs more readily if insulin is given at the same time.

It should be constantly borne in mind that at no time should large amounts of fluids be given, for it produces cardiac over-taxation and renders the patient prone to pulmonary edema. In this connection it is well to stress the point that digitalis therapy should be enforced, not necessarily in massive doses, to guard against cardiac collapse and in the prevention of the above complication. In the use of colonic irrigation, either glucose or sodium bicarbonate is preferred, repeating same every four or five hours. Irrigations are essential because these help to empty the bowel, stimulate the kidneys to secrete, produce moderate diaphoresis, to a certain degree dilute toxins by the absorption of fluid, and prevent acidosis. It also excites uterine contractions and thus may bring about the onset of labor.

From the foregoing facts it can be readily seen that the advances in our knowledge of eclampsia have not been marked and we have learned little to better our treatment. Recently, greater attention has been paid to the water balance in the system, and this is, perhaps, the only real improvement.

A series of cases have been presented by Arnold and Fay illustrating a method of fluid limitation and dehydration therapy. These observers claim it is unnecessary to adhere to the belief that large quantities of fluid are essential to wash out the toxins and to recognize that many of the toxic symptoms are produced by the use of excessive fluids. The cardinal points in their line of treatment are as follows—Fluids must be judiciously withheld until elimination by bladder, bowel and skin is established. Following response to dehydration therapy, fluids can be forced in proportion to elimination. Saline therapy is contraindicated, due to the fact that there is a retention in the tissues of chlorides and sodium ion, resulting in blood concentration. The method of blood dilution consists in the intravenous use of hypertonic glucose solutions (20 to 25 per cent), this serving not only as a hypertonic dehydrating agent but to combat acidosis through its nutritional value and by direct stimulation of the renal glomeruli. This method has been in use during the past two years, and the authors strikingly point out the absence of any mortality in their series.

In the pre-eclamptic type it is well to administer one ounce of castor oil with 10 grains of quinine, and repeat 5 grains in three hours. The insertion of a bag or artificial rupture of the membranes will aid materially in the induction of labor.

With the onset of the first convulsion, the case assumes a most serious aspect. The nervous balance has been greatly disturbed and one convulsion is likely to lead to another. Therefore, the chief aim should be to prevent the death of the mother.

Braun emphasized the fact that convulsions ceased or became less severe following delivery. Dührssen showed that in 93 per cent, and Olshausen 85 per cent, such a result was noted. Seitz reported 123 cases in which convulsions ceased after delivery, there was a mortality of 20 per cent in spite of the absence of convulsions. Another strong argument for early delivery is the larger number of children saved thereby. There are many who advise Caesarean section, vaginal hysterotomy and accouchement forcé. The results, however, are not entirely satisfactory. Peterson collected statistics of both vaginal and Caesarean section in more than a thousand cases, and, although apparently advocating this treatment, the mortality reached about 25 per cent.

It is well to note that eclamptic women do not endure surgical operations well. We are dealing with a severe toxic and degenerative affair, and with the addition of local or general anesthetic they easily sucumb to shock. Caesarean section as a routine procedure should

be discouraged. It is best recommended only when there is a long, rigid, and undilated cervix, or in the presence of a tumor or contracted pelvis, large fetus or unfavorable presentation.

Theoretically, there is much to advise in the operative delivery. It is a known fact that the convulsions are due to pregnancy; it is a common occurrence to note that after delivery the convulsions usually cease. It would seem, then, that the immediate delivery ought to cut short these seizures, but as a matter of fact this does not always take place, and, even if there were no convulsions, the mortality may still remain high. Statistics show that with eclamptics treated by radical methods, the maternal mortality approaches an average of 10 to 40 per cent, fetal mortality 40 to 50 per cent.

In order to shorten the second stage, a mid or low forceps may be employed, or version and extraction, the amount of anesthetic (preferably nitrous oxide and oxygen) used being very small.

Several years ago surgical intervention was by far the method of choice. At present the pendulum is strongly directed toward conservatism. Up to 1925, Stroganoff treated 300 cases by means of his conservative therapy with maternal mortality of only 2.6 per cent; McCord 3 per cent in 100 cases; Beck 6.3 per cent; Stockholm Maternity Hospital 9 per cent; at Rotunda, in Dublin, Fitz Gibbons' mortality reached 10 per cent; Williams' 13.3 per cent. The results of the discussion at the British Obstetrical Congress in 1923 showed clearly that palliative measures were satisfactory, and since that meeting non-radical steps have been popular in Great Britain and Ireland. Solomons, of Dublin, states that Caesarean section in Ireland met with disaster in the treatment of eclampsia. DeLee adheres to conservative methods, but induces labor if patient fails to improve, or if she is near term. He further points out if patient is in active labor, making rapid progress, and her condition not alarming one should cling to conservative therapy.

Clinically, it is observed that pains usually begin if the convulsions are at all severe, and labor is often rapid when once begun. If labor has not yet set in, the insertion of a bag or rupture of membranes will usually bring about the desired results. In certain cases it may be best to wait until the active convulsive stage has passed. Induction of labor may be easily accomplished while the patient is in deep narcosis.

For the sake of completion, mention is here made of other forms of medication the use of which has been more or less discarded: thyroid extract, veratrum viride, gum acacia, intravenous injection of serum from normal pregnant women, lumbar puncture and renal decapsulation.

Since convulsions may recur even after a week, the patient requires constant supervision, especially if signs of puerperal psychoses develop, for in such types an attempt may be made to kill herself or baby. All sources of worry and irritation should be removed. Nursing should not be permitted until patient has regained consciousness for few days and when her strength justifies.

Conclusions

Adequate prenatal care has markedly reduced eclampsia. Rigid adherence to calcium intake is important. Treatment of preeclamptic toxemia will usually prevent true eclampsia and renal pathology. Conservatism is advocated with the following points of emphasis: Protect patient in a hospital; attempt to save life of mother and fetus; narcosis with morphine, chloral and bromides is preferred; venesection lowers blood pressure and reduces pulmonary edema; magnesium sulphate (20 c.c. of a 10 per cent solution) is very useful; hypertonic glucose solution is given intravenously; volume of fluids must be in moderation; open avenues of elimination; high colonic irrigations are helpful. After the attack, patient is closely guarded for at least three years, especial attention being paid to renal function, and no pregnancy is advised until that time. The woman with eclampsia "does not vaccinate herself" or develop an immunity. Recurrent eclampsia takes place in about 2 to 5 per cent of cases. Nephritic toxemia is very apt to appear in later pregnancies.

The fact is to be re-emphasized that we must be radical in our conservatism; half-way measures, such as employing morphia timidly in 1/8 gr. doses and removing little or no blood, invite failure. Eclamptics are poor surgical risks and liable to shock and infection; therefore, operative intervention should be done only in selected cases. In eclampsia there is a concentration of the blood. Changes of pro-

teids may be the cause of the alteration in blood volume. Convulsions cause an acidosis which intensifies the changes in the proteins. The concentration precedes the convulsions and is intensified by the convulsions; hence, treatment of this condition—both threatened and active—is to dilute the blood.

301 *East Franklin Street.*

FOLLICULAR AND DENTAL ROOT CYSTS—THEIR CLINICAL, PATHOLOGICAL, AND ETIOLOGICAL FEATURES.*

J. Lewis Walker, Jr., D. D. S.,
Norfolk, Va.

I. Introduction

In a recent article on cysts occurring in the maxillae and mandible one author[1] expressed the opinion that a review of their etiology would seem elementary and unwarranted. On the other hand, Blum,[2] who has written quite extensively on the subject, says it is remarkable that in spite of their frequency so little is known of cysts of the jaws, particularly as to their origin. A review of the literature seems to bear out this latter author's contention.

A variety of names have been used to designate follicular and dental root cysts and the frequent confusion of terms is not surprising. As to their true nature, the connotation of the two terms used here seems to be greater than that of any of the others, and in the recent literature they appear to be the more generally accepted. However, it would seem proper at this point to enumerate the more common synonyms. Follicular cyst is synonymous with dentigerous cyst and odontocele; dental root cyst is synonymous with radicular cyst, inflammatory root cyst, granulomatous cyst, pericemental cyst, etc.

It has been said that a correct diagnosis will lead to proper treatment. This is true, but I would enlarge upon this axiom by saying that with a thorough knowledge of the etiology as well as of the clinical and pathological features of a condition, an incorrect diagnosis will be the exception. With reference to the two types of cysts under discussion, an understanding of these three factors is of utmost value in indicating to the surgeon the type of operation which can best be employed and the results he can reasonably expect. For example, the immediate closure method, first described by Harrison,[3] may be admirably used in certain of these cases but could not be satisfactorily applied in others. Both types of these cysts are benign, and, when recognized as such, the more radical treatment necessary for malignancies is avoided. This will mean a conservation of teeth, bone, and soft tissue, which in turn will result in less facial deformity and impairment to the masticating apparatus.

When an extensive circumscribed area of bone destruction is discovered within the maxillae or mandible, the question to be decided first is: Is the condition malignant? In many cases x-ray examination will confirm the diagnosis. In others, a positive pre-operative diagnosis is difficult or even impossible. A careful study of the mouth and dental arches with a history of any missing teeth will often give a valuable clue in these doubtful cases and may not only establish the fact that the case is or is not malignant, but, if it is one of these benign cysts, will often determine its type. The following case which was observed by Bloodgood[4] will illustrate this point:

> A patient complained of several loose teeth in the mandibular molar region. A radiograph was made and the several teeth removed on account of "root abscesses." The wound in the mouth did not heal, and after a year another radiograph was made of the same region from which a large area of bone destruction was diagnosed as benign follicular cyst. Malignancy was not suspected and an operation was done on this radiographic diagnosis alone. Routine tissue examination brought in the report of spindle-celled sarcoma, and subsequent surgery and irradiation failed to save the patient's life.

In citing this case the implication is not that the diagnosis would have been correct had merely a careful examination of the mouth been made, but had this been done, benign follicular cyst would have been excluded early as a possibility. In this particular instance a number of roentgenologists and surgeons diagnosed the condition from the radiograph as benign follicular cyst. Bloodgood himself says of the case that no one remembered to

*Read before a joint meeting of the Norfolk County Medical Society and the Virginia Tidewater Dental Association, Norfolk, Va., November 21, 1932.

make a careful study of the condition of the mouth. An extensive leukoplakia of the oral mucous membrane of long standing was overlooked.

II. Characteristics Common to the Two Types

Of the several types of intraosseous cysts of the maxillae and mandible, the follicular and dental root cysts are by far the most common. The smaller ones are often discovered by accident in the course of routine x-ray examination of the teeth, when they are easily diagnosed. The larger ones, however, have many characteristics in common and their differentiation is sometimes difficult.

Any part of either jaw may be involved. In the maxilla they may attain such size that the maxillary sinus is nearly obliterated, being compressed to a very small size but retaining its entity within its bony cavity. At times the bony partition between the sinus and cyst will have been destroyed and the cyst lining will be contiguous with that of the sinus and there may or may not be intercommunication between the cyst and sinus. The bony roof of the mouth and the floor of the nose or orbit may be invaded. The nasal passage on the affected side may be partially or completely obstructed. In the mandible they also attain considerable size. Here they often deflect the normal inferior dental canal and its contents. A neuralgia about the face, whose cause is at first vague, may be due to pressure on a nerve by a growing cyst.

There may be a marked bulging of the much thinned cortical plate of bone which will produce "parchment crackling" when digital pressure is applied. The bulging is usually toward the buccal side, and may be so extensive that there is a deformity of the face to be noted externally. A lack of symmetry in a dental arch is sometimes the earliest clinical indication of a cyst. This is noted often in the maxillae when an otherwise normal dental arch is distorted by a downward displacement on one side. Fracture of the mandible from a very slight trauma when there has been no suspicion of a cyst has sometimes led to the discovery of a very extensive one. The mucous membrane over these cysts appears normal unless secondary infection has occurred, and while they may be uncomfortable due to their size and location, they are rarely painful. In the absence of infection there is no enlargement of the submaxillary or cervical lymph glands, unless a malignant change has occurred, and this is rarely the case.

The *radiographic appearance* of the larger cysts of both types is very similar. The margins surrounding the dark area of the cavity are usually sharply defined and smooth, and there may or may not be an outer rim of condensed bone. Frequently, especially in the maxillae, the radiograh will show bony septa, giving to the cyst a multilocular appearance. It has generally been found, however, that the septa are incomplete and that the cysts are unilocular. This may be demonstrated preoperatively by aspirating some of the cyst fluid and injecting a quantity of some radiopaque fluid into the cavity and making a series of radiographs with the head in various positions. If the radiopaque medium used is of sufficient specific gravity to displace any of the remaining cyst fluid, it will be seen from such radiographs that the medium will flow freely to all parts of the cyst. A degree of success in determining the size and extent of some of the larger cysts has been had by the injection of the radiopaque iodized poppy-seed oil (lipiodol) followed by radiography. Radiography with this oil is also of value in determining whether there has been involvement of or communication with the maxillary sinus.

Histologically, the walls of these two types of cysts are essentially the same, but are subject to many modifications. Examination of a section seldom offers any conclusive evidence as to its type. There are two layers, an inner lining and an outer layer or wall proper. The inner lining consists of epithelium which may be stratified or consist of but one or two layers of flattened or cubical cells. The wall proper consists of fibrous connective tissue which may be of varying thicknesses. It may be very cellular or very fibrous, and its fibers may be loose or very densely packed. Some cysts of the maxillae have been reported as being lined with ciliated columnar epithelium. It is believed that such a lining is derived from invasion of the maxillary sinus by the growing cyst, or that its origin is from an aberrant germ of the sinus, having no connection with the dental system.

The *content* of these cysts is usually viscous and sticky, having a grease-like feeling between the fingers, or it may be very thin and watery. Sometimes it is of a semi-solid consistency. In color it is usually light yellow

or amber, but it may be maroon or dark brown due to the presence of blood. Cholesterol crystals, which are nearly always present, impart to the fluid a "mother-of-pearl shimmer" in reflected light. In many of the older cysts the fluid is sterile, and when bacteria are found in the absence of any inflammatory clinical signs, they are usually of the non-virulent type.

III. Follicular Cysts

A follicular cyst may be defined as an abnormally distended tooth follicle wall lined on its inner surface with the modified epithelium of the enamel organ, and usually containing within its sac the tooth from whose follicle it arose.

Follicular cysts may be found in patients of any age, but usually undergo their most active growth during the period of eruption of the permanent teeth, or between the fifth and twenty-fifth years. They may arise from the follicle of any tooth, but the most frequent ones involved are those of some of the most frequently unerupted teeth, which are, most notably, the maxillary cuspids and mandibular third molars. In the anterior region of the mandible these cysts may extend from one side to the other; in the maxillae they seldom extend beyond the median plane from the affected side.

The follicle of an unerupted supernumerary tooth will often undergo cystic distention and the origin of such a cyst may be obscure until the discovery of the tooth. Cysts of the follicles of deciduous teeth are extremely rare. Howard[5] has reported a very interesting case in an infant of twenty-eight months in which there was extensive swelling of the cheek and inflammation of the eye for several months prior to its correct diagnosis. The lacrimal duct was occluded by the cyst which arose from the follicle of an impacted deciduous cuspid.

The frequency of occurrence of follicular cyst about the maxillary cuspid is not surprising when the deep-seated position of its germ and frequency of impaction is remembered. In this connection it is interesting to note that Todd,[6] who has so ably described the evolution of the dentition of mammals, states that the deeply situated rudiment of this tooth is a sure sign that in early man it was as powerful and long-rooted as it is in the anthrapoids today. Most of the follicular cysts which invade the maxillary sinus arise from the follicle of this tooth, when many times the tooth is found in a position very remote from normal, and symptoms may be referred to the sinus which complicate a diagnosis.

Careful dissection of a follicular cyst *in situ* will show the root of the contained tooth to be more or less firmly imbedded in bone, and upon close examination the cyst wall will be found to become very thin as it nears the tooth. The wall is tightly attached to the root, the attachment beginning at the tooth neck and continuing along the sides of the root over the apex, the entire tooth being thus enveloped. A section cut here would show that the epithelial lining of the cyst stops at the neck of the tooth where the attachment of the wall to the root begins. The thin portion of the wall which is attached to and envelops the root consists of fibrous tissue which may contain a few scattered epithelial rests. If the root is not completely formed, as is frequently the case, there will be found a sheath of epithelium at its apical end. This is the epithelial sheath of Hertwig which is formed from the enamel organ. In enucleating these cysts it is important to remove or destroy the tissues which contain these epithelial remnants, for failure to do so might result in recurrence.

The fact that numbers of unerupted teeth are seen in individuals of all ages with no cyst formation, and, also, the frequent occurrence of two cysts arising from the follicles of two corresponding teeth, i. e., one on each side of either the maxillae or mandible, suggests that the constitutional tendencies of the individual play a part in their genesis. This thought was advanced by Bunting.[7]

It would also seem reasonable to suppose that an irritation of some kind to the epithelial cells lining the follicle wall could be the primary cause of its cystic distention. In the case of an impacted tooth where there is a physical obstruction to its movement or growth, this obstruction as an irritating factor is obvious. But many of these follicular cysts are seen about teeth with no apparent cause for their failure to develop or erupt. In these latter cases the failure may be due to a physiological disturbance, perhaps in calcium metabolism. Whether the cause of noneruption is physical or physiological, that cause would seem to be a factor in the production of a primary irritation. It would seem to follow then, that with a process of degeneration and proliferation once under way in the

epithelial lining, that a secondary and continuous irritation would be set up due to pressure of the increasing fluid and cystic distention would continue. It should be remembered, as has been pointed out by Orban,[8] that the epithelial cells lining the coronal portion of the normal tooth follicle wall remain intact as a lining until the tooth erupts, a fact which would indicate that these cells have a function to perform other than that of building enamel.

IV. Dental Root Cysts

A dental root cyst may be defined as a cyst of inflammatory origin, arising at the apex of an erupted tooth, and having its inception in a periapical granuloma which contained certain epithelial remnants of the enamel organ.

There is no definite age limit for the occurrence of dental root cysts, though they generally occur in adults. They may be found at the root of any permanent erupted tooth, and are most often seen arising at the root of the maxillary lateral incisor, this being due, in all probability, to the frequency with which this tooth suffers from caries and subsequent infection and death of its pulp. A search of the literature fails to reveal any cases reported as occurring about the deciduous teeth.

The chief difference in the clinical and pathological features of follicular and dental root cysts, other than what is obvious from their respective definitions and the foregoing description, is the tendency of the latter to extend through the median plane in the maxillae. This extension to the opposite side seldom occurs in the follicular cysts, as has been mentioned.

The factors which bring about the production of periapical granuloma are comparable to those which give rise to granulation tissue elsewhere in the body. In the vast majority of cases the initial inflammation is due to exposure and infection of the dental pulp with its subsequent death. However, granulomas are also observed at the apices of teeth free from caries and otherwise apparently sound and with pulps that may be vital or non-vital. In these latter instances, trauma to the periapical tissues is probably responsible for the primary inflammation. If the cause of an inflammation is not removed and there are recurring acute and subacute flare-ups, the process becomes one of chronic inflammation and the granuloma results.

A periapical granuloma is a mass of granulation tissue which varies in size from that of a pea or smaller to that of an olive. It has a capsule of fibrous connective tissue which is attached to the tooth root near its apex. The granulation tissue within the capsule consists of many dilated thin-walled vesesls in a stroma of fibrous connective tissue which is interspersed with lymphocytes, plasma cells, leukocytes, and giant cells. The lymphocytes predominate.

All granulomas do not give rise to cysts. To undergo cystic changes a granuloma must contain epithelium. Epithelium is not a constant finding in granulomas, however, and one that does contain epithelium differs in this respect from granulation tissue which occurs anywhere else in the body[9]. As has been shown by Orban[10] and Higaki[11], epithelial rests derived from the sheath of Hertwig are often found in a quiescent state in the normal pulp and periodontal membrane, and also, at times, in the osseous canals which transmit vessels and nerves to the tooth and in the cancellous bone of either maxillae or mandible. These rests are believed to constitute the epithelial elements found in granulomas.

Cyst formation from a granuloma is due to a combination of factors, but changes in its epithelial content stand out as the more important. Degeneration of the granulation tissue is followed by a proliferation of its contained epithelium which tends to surround and encapsulate the degenerated area. This is probably the beginning of cyst formation. Bacteria may be responsible for this primary degeneration, the end-product of which might be of such a nature chemically that it will produce degenerative changes in the epithelium. With the increase in fluid from these degenerated tissues there is the added influence of mechanical pressure, which, it will be remembered, is also a factor in the growth of a follicular cyst. Thus, we see that bacterial, chemical, and mechanical causes may all play a part in the production and growth of a dental root cyst, there being a seemingly endless process set up unless relieved by rupture, which is unusual.

A root cyst may be retained after extraction of the tooth at which root it arose, or such a cyst may develop from a retained granuloma.

A retained dental root cyst might offer difficulty in its diagnosis when seen in a patient with an unerupted tooth in a nearby region. In other words, it may be mistaken for a follicular cyst arising from the follicle of the unerupted tooth. As a granuloma may be found at the apex or along the lateral sides of the root of a tooth which has a vital pulp, so might a cyst have its origin in such a granuloma, the cyst developing to large size and the tooth retaining a vital pulp.

V. Conclusions and Summary

A discourse upon follicular and dental root cysts would not seem complete without mention of the adamantinoma or multilocular cyst, which is the third of the so-called epithelial odontomas. Follicular and dental root cysts are benign. The adamantinoma is considered malignant, the degree of malignancy depending upon the extent to which its epithelium has the characteristics of the embryonal epithelium. Cohnheim's theory of embryonal tissue-remains as an explanation of the cause of malignant neoplasms holds that the closer the tissue characteristics of a neoplasm revert to or retain the characteristics of its mother tissue, the higher the degree of malignancy. A comparative study of the histopathology of the various cysts of the jaws seems to uphold Cohnheim's theory. Follicular and dental root cysts have an epithelium which is far removed in character from an embryonal epithelium, while the typical adamantine epithelial cells resemble more or less closely the ameloblasts of the enamel organ.

It is obvious that this discussion is not an attempt at an exhaustive treatise of the several varieties of cysts occurring in the jaws and their differentiation. The effort here has been to review some of the fundamentals of the pathogenesis of but two types which are the most common. Very often these two types will present modifications which render their differentiation from other tumors or growths of the jaws extremely difficult.

I would like to stress again the possible danger of proceeding with any surgery until all available means are used to establish a diagnosis. We are all aware of the much too common practice of referring a patient with an abnormal enlargement about the jaws to a roentgenologist and relying solely on his report as a basis for treatment. To be sure, an x-ray examination is most essential, but if accepted alone on its face value with but a casual examination from other standpoints, one attempting to do surgery about the mouth will at times fall into grave and irreparable errors.

The other points brought out in the foregoing discussion might be summarized as follows:

1. Clinically and pathologically follicular and dental root cysts present many similarities. No criteria can be set up as to their local point of origin or age incidence.
2. The epithelium found in both of these cysts is derived from different parts of the enamel organ.
3. In their origin, follicular cysts usually involve unerupted teeth. Dental root cysts arise at the apices of erupted teeth.
4. Follicular cysts arise as the result of an irritation not associated with infection primarily. Dental root cysts have their origin in the end-result of an inflammatory process, namely, the periapical granuloma, which usually, but not always, follows infection and death of the dental pulp.
5. An understanding of the pathology of these cysts, which is so essential to their successful surgery, can come only through a thorough knowledge of the embryology of the dental system.

Bibliography

1. Aison, Emil L.: Dental Cysts and Their Surgical Treatment, *J. A. D. A.*, 15:1437, August, 1928.
2. Blum, Theodore: Do All Cysts in the Jaws Originate from the Dental System? (With a Report of Two Non-Dental Cysts Lined with Ciliated Columnar Epithelium), *J. A. D. A.*, 16:647, April, 1929.
3. Harrison, Guy R.: Immediate Closure of Wounds About the Mouth and Jaws, *J. A. D. A.*, 13: 1066, August, 1926.
4. Bloodgood, Joseph Colt: Problem of Pain in a Tooth or a Spot in a Jaw, of a Loose Tooth or Teeth, an Abscess or a Swelling of the Lower Jaw, *J. A. D. A.*, 19:1566, September, 1932.
5. Howard, Menefee R.: Follicular Cyst Associated With an Impacted Cuspid in an Infant—Report of Case, *J. A. D. A.*, 18:2401, December, 1931.
6. Todd, T. Wingate: Mammalian Dentition, St. Louis: The C. V. Mosby Co., pages 261-262, 1918.
7. Bunting, Russell W.: A Textbook of Oral Pathology, Philadelphia: Lea and Febiger, page 464, 1929.
8. Orban, B.: Dental Histology and Embryology, Philadelphia: P. Blakiston's Son and Co., page 172. Second Edition—1929.
9. Moorehead, Frederick B., and Dewey, Kaethe W.: Pathology of the Mouth, Philadelphia: W. B. Saunders Co., page 127, 1925.
10. Orban, B.: Dental Histology and Embryology,

Philadelphia: P. Blakiston's Son and Co., page 166 and others. Second Edition—1929.
11. Higaki, Rinso: Besondere Befunde von Epithelnestern auBerhalb des Periodontiums, *Deutsche Monatsschrift fur Zahnheilkunde.* (Reprint from the University of Vienna). April 15, 1932. (Translated by F. G. L. and J. L. W., Jr.)

705 *Wainwright Building.*

AN OPERATION FOR THE FUSION OF THE TIBIO-ASTRAGALOID JOINT.*

H. H. Wescott, M. D., F. A. C. S.,
Roanoke, Va.

A disease or injury to the ankle joint or tibio-astragaloid joint often makes necessary a fusion of the joint to improve the gait or to relieve pain. The joint is in the form of a mortice and because of its location has imposed upon it most of the body weight. Because of the weight thrust through the joint, disruption of the cartilage is disabling.

For years, it has been comparatively easy to produce an arthrodesis of the subastragaloid joint by removing the cartilages of the opposing surfaces. A well stablized foot for weight bearing results within ten to twelve weeks. By the same method, a fusion of the tibio-astragaloid joint requires six to eighteen months. Sliding bone grafts from the tibia on the anterior and posterior aspects of the joint influence very little the length of time necessary to produce a firm ankylosis of this joint. Certain factors that retard union, and at times produce a non-union in fractures of the lower one-third of the tibia, may influence the healing of these bones. Though there is no fracture above the joint to influence the blood supply from the nutrient artery, there is to a greater or less extent, an interference with the blood supply in the region of the incision.

The structure of the bone underlying the cartilage in both the tibia and astragalus is very dense with poor circulation, and the contraction of the strong muscles of the leg in any change of position possibly results in some movement of the joint in spite of the external fixation of casts or braces.

A method of fusing the joint has been attempted with the idea of removing a sufficient amount of bone in both the tibia and astragalus to result in a better blood supply without shortening the extremity, and producing a complete mortise from inside the joint.

During the operation, the foot is held by an assistant in plantar flexion of five degrees for the male, and fifteen degrees for the female. Through an incision over the internal malleolus, a block of bone is removed extending through the joint, one-fourth inch in width and one-half to three-fourths inches in height. This opening, with the three-fourths inch axis in line with the shaft of the tibia, is extended through the ankle joint, its upper one-half in the tibia and the lower one-half in the astragalus. It is carried into the fibula until its inner one-half has been entered and the small block of bone removed.

A graft is taken from the tibia of sufficient width to fill the greater diameter of the tunnel, and twice the length of the depth of the tunnel through the joint. The graft is divided at its center and placed cortex to cortex to double its thickness. The two pieces of graft are driven in as one, through the opening in the malleolus and through the joint into the fibula. External fixation with casts or braces becomes unnecessary as the graft acts as a key, producing complete fixation from the inside.

E. M., age 15, a white female, was seen September 30, 1930, complaining of pain in the right ankle following exercise. There was present moderate swelling on both anterior and posterior borders of the tibio-astragaloid joint. She was seen twenty-three months later complaining of severe pain and swelling of two months duration following a slight twist of the ankle. She appeared under-nourished and very excitable. Von Pirquet test was positive and roentgenograms showed marked roughening of the tibio-astragaloid joint. The foot was fixed by muscle spasm. A diagnosis of tuberculosis of the tibio-astragaloid joint was made. A cast was applied and she was put to bed for three months, followed by limited exercises without weight bearing for two months. Improvement in her general condition fol-

*Read before the Roanoke Academy of Medicine, Roanoke, Va., on November 6, 1933.

lowed. On January 23, 1933, there was very little swelling of the joint, but pain with muscle spasm was present on weight bearing.

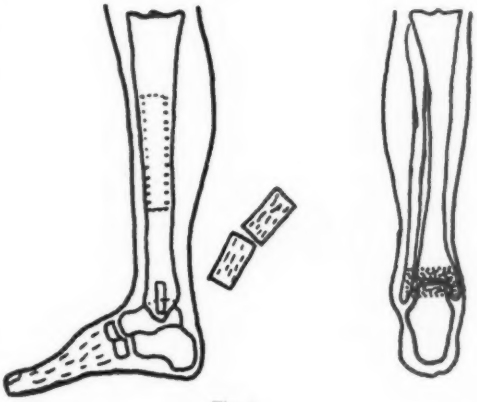


Fig. 1.

She was admitted to the hospital on January 23, 1933, and operated upon on January 26, 1933. Under ethylene anesthesia, a bone graft five-eighths inch wide and 5 inches in length was removed from the upper part of the tibia. The length of the graft was twice that of the width of the ankle joint which was two and one-half inches, measured from the inner surface of the internal malleolus to the center of the external malleolus. The five-inch graft was cut at its center and lapped, cortex to cortex. It was placed in a saline sponge until needed. A two-inch incision was made in line with the shaft over the internal malleolus. The periosteum was elevated and the soft tissues retracted. With a narrow bladed osteotome, a block of bone one-fourth by five-eighths inches was removed from the medial surface. The center of the opening was made to correspond with the center of the tibio-astragaloid joint and directed to emerge at the center of the fibula. The foot was held in fifteen degrees plantar flexion and the tunnel carried through the tibia and astragalus and through the medial one-half of the fibula. The specimen of bone and cartilage removed showed pathological changes. The cartilage was dull and stripped easily from the bone, but no free pus was encountered. The diagnosis of tuberculosis was substantiated by guinea pig inoculation.

After closing the wound, the joint was found to be stabilized. The bone graft, which acted as a key, made unnecessary the immediate application of a cast. On the tenth day, after removal of the stitches, a cast was applied from toes to knee. The cast was removed sixteen weeks from the date of operation, and weight bearing allowed four weeks later. There has been no pain or discomfort in the ankle joint since the day of operation.

The key graft operation will probably render unnecessary the plaster cast fixation. There is a smaller probability of draining sinuses resulting from the operation, as the opening in the bone is completely filled by the graft. Fixation may be supplemented by the removal of cartilage between the bones together with sliding grafts along the tibia into the astragalus. The key graft may also be employed to produce internal fixation in the operations of Dr. Vulpius or Dr. Straub. They produce arthrodesis by dislocating the joint, removing the cartilage and, after longitudinally splitting the astragalus, wedging it apart to fit both malleoli. The former uses cartilage to fill the gap in the split astragalus and the latter makes use of a bone wedge from the neck of the astragalus.

In diseased hips, the use of the extra articular bone graft, acting as an instrument of internal fixation in producing ankylosis, has been accepted as the method of choice. The removal of the joint cartilage has been found to be unnecessary due to the complete fixation of the joint by the bridging bone. It is to be hoped that the key graft operation will produce a like result, thereby eliminating a massive operation which makes necessary the division of nerves and tendons around the ankle joint and also prevents the stirring up of a latent infection.

REFERENCES

Straub, George F., M. D., F. A. C. S., Honolulu, Hawaii, Arthrodesis of the Ankle. *Surgery, Gynecology & Obstetrics*, May, 1927, Volume XLIV, No. 5, page 676.

Vulpius & Stoffel. Orthop. Operationslehre, 1913, p. 453.

Medical Arts Building.

AN OVERLOOKED FACTOR IN SUSCEPTIBILITY TO THE COMMON COLD.

ARTHUR E. EWENS, B. S., M. D.,
Atlantic City, N. J.

There is probably no more formidable enemy to human health and comfort than the common cold, the widespread incidence of which continues to defy both etiologic explanation and prophylactic control. This ubiquitous malady not only inflicts upon this country a direct economic loss of four hundred and fifty million dollars annually,* but paves the way to a host of refractory catarrhal difficulties that impose a further sacrifice of occupational efficiency and an ever-increasing need for the largest group of specialists in the entire field of medical practice.

Recent efforts to curb the ravages of this universal plague have been focused upon the possible identification of a specific causative agency, the assumption being that prospective laboratory findings offer about the only hope of success. There has been no definite proof, however, that a distinct bacterial cause exists, and even if one were ultimately isolated it is questionable whether the perplexities of the problem would be materially lessened. It is rather difficult to visualize serological protection against a disease which itself tends to augment, rather than diminish, subsequent susceptibility. More readily conceivable are the altruistic possibilities that might accrue from the detection of an eliminable anatomic factor in man's vulnerability to catarrhal infections. Theoretically, a structural abnormality could induce lowered resistance to organisms normally present in the nose and throat and, if common to a great many individuals, might more logically explain the prevalence of "colds" than the supposed aggressiveness and specificity of an undiscovered bacterium or virus. Such an hypothesis is quite consistent with the negative results of bacteriological investigation, and is by no means a vain conjecture. It is actually true that clinical research has overlooked one correctable somatic impairment whose predisposing influence is empirically and convincingly demonstrable, and whose delayed recognition seems measurably responsible for the erstwhile futility of the fight against the common cold.

This overlooked factor is none other than that apparently innocuous structure,—the uvula—so often carelessly designated as "the palate" by both the laity and the profession. This devitalized and physiologically superfluous appendage has never received any critical consideration beyond that accorded it by Hippocrates, who recognized its frequent elongation as a mechanical cause of paroxysmal coughs and advocated staphylotomy as a corrective measure. Unfortunately, Hippocrates' suggestion has never attained great popularity. Had its practical utility in dealing with innumerable cases of convulsive coughing and incessant clearing of the throat been properly appreciated, a vastly more important potentiality of this procedure would inevitably have come to light long before the twentieth century. The main impediment to this revelation has been, and still is, a superstitious and erroneous conception of the functional importance of the uvula, in consequence of which staphylotomy has been inadequately performed even when "cautiously" resorted to.

A customary degree of hesitancy and conservatism dominated the writer's early employment of staphylotomy, but it soon became apparent that a bolder procedure involved none of the dreaded risks and was much more efficacious and dependable. Gradually this was found to be true up to the point of removing the uvula in its entirety,—an operation which has since been performed many hundreds of times, and with results as unprecedented as the operation itself. Routine use of "*staphylectomy*" for the relief of habitual clearing of the throat and an amenable type of paroxysmal cough eventually revealed the rather amazing fact that it also exercised a remedial influence upon catarrhal conditions of the entire upper respiratory tract. Primarily, this was not an objective disclosure, nor was it even a suspected possibility. It was purely accidental. The original observations must be accredited to patients themselves, who repeatedly called attention to various unanticipated benefits conferred by staphylectomy, notably a relative freedom from "colds," but whose alleged experiences were at first regarded as sheer products of the imagination. Except for the repetition and enthusiasm of these incredible con-

*Based upon statistics of the U. S. Public Health Service.

tentions they might not have aroused the slightest interest, for there seemed to be, at that time, no logical reason to suppose that the mere removal of a small piece of redundant tissue from the faucial arch could produce the remote and phenomenal effects which these patients were wont to ascribe to it. About twenty years have now elapsed since a skeptical investigation of this apparent myth was thus inaugurated, and the unique experience to which it led has afforded incontestable proof of the provocative role of the uvula in uncontrollable recurrences of the common cold and in the intractability of other catarrhal difficulties involving both the nose and throat.

By painstaking follow-up methods and the helpful cooperation of interested patients it has been determined that staphylectomy checks susceptibility to "colds" in excess of 50 per cent. In occasional instances a complete absence of recurrences has been reported for periods of several years, and rarely have indifferent results been observed. Exact percentages of efficiency cannot be tabulated, the controls in this investigation having necessarily been in each case the past experiences of the subject himself. Patients are seldom able to state accurately the number of attacks per year they have previously encountered, but they can make post-operative comparisons that are sufficiently definite for practical purposes, and the contrast is usually so sharp that a precise ratio becomes relatively unimportant. What applies to the comparative frequency of "colds" before and after staphylectomy is equally true concerning the abated intensity and duration of infections that may develop after the uvula has been removed. A peculiar phase of the latter observation is the mildness or entire absence of sinusitis in cases where this had invariably been a troublesome accompaniment or sequel of rhinitis prior to operation.

The effectiveness of complete removal of the uvula has been substantiated not merely through subjective information, but by significant and unmistakable changes in both pharyngeal and nasal structures. The most conspicuous of these visible effects are so prompt and decided in some instances as to literally defy belief. Chronic post-nasal engorgement is reduced to a degree that definitely facilitates nasal breathing, and the characteristic signs and symptoms of pharyngeal and nasopharyngeal catarrh are rendered permanently less pronounced. These clearly discernible effects are more than suggestive of a contributory culpability of the uvula in marked catarrhal tendencies; in fact, they have been so constantly observed as to admit of no other interpretation.

The part played by the uvula in predisposition to the common cold and kindred affections may not appear so strange and inexplicable if we take into consideration the extremely poor vascularity of this structure and its other correspondingly sparse histologic components, which would unavoidably render it less resistant than the substantial and well vascularized portions of the pharynx. Furthermore, its anatomical location is especially favorable to the accumulation of ceaseless installments of bacteria—dangling directly in the pathway of both respiration and deglutition. It is thereby subjected also to more or less mechanical abuse, particularly in the act of snoring. These combined characteristics make the uvula an ideal bacterial nidus upon which micro-organisms gain a flourishing foothold, subsequently invading in overpowering numbers the posterior nares and other contiguous areas that might otherwise be capable of maintaining a relatively healthy status. (In striking conformity with these practical considerations is the well-known fact that the earliest symptom of an incipient coryza is not referable to the nose, but is almost invariably a sensation of dryness and pruritic discomfort in the vicinity of the soft palate, nasal involvement being a somewhat delayed development).

This line of reasoning may appear fundamentally defective in that it wholly ignores the supposed functional requisites of the uvula. But does the uvula really serve any distinct or valuable purpose in the human being, or is it a superfluous and rudimentary structure? In lower animals it is essential to a reflex expulsive mechanism of vital importance. During the act of panting it thus affords protection against the hazardous ingress of flying insects and other foreign material, but aside from its participation in this highly necessary defense of the larynx and pulmonary tract it serves no other purpose for which the major portion of the normal velum palatinum does not alone suffice. The life and habits of primitive man undoubtedly demanded similar protection, but it has been a long, long time since man ran through the

wilds—panting. Since civilization abolished this need of the mouth as an accessory avenue of breathing the uvula has had virtually no function to perform, and protracted disuse has relegated it to the category of obsolete and decadent structures. As in the case of the appendix vermiformis, cessation of function has impaired its blood-supply, decreased its size and substance, lowered its vitality in general and transformed it into a mere rudiment and an insidious pathogenetic factor. Its pathological influence upon adjacent structures might be likened to that of an extraneous growth similarly situated, as there is a direct parallel in the observed effects of excision. Corroborative evidence of this supposed evolutionary and diminutive change in the physical characteristics of the uvula is afforded by a comparison of this almost cylindrical remnant, as it now exists in the human being, with the substantial, broad, triangular curtain suspended in the throat of the lower animal. Scores of dried specimens in the writer's possession bear convincing testimony to this advanced degenerative transition.

Within the past year an interesting counterpart of this hypothesis appeared in the editorial columns of a metropolitan newspaper under the heading: "*Colds and Evolution.*" Although written in the abstract and with no implied reference to the uvula, this article presented a truly prophetic assumption that justifies its quotation, in part, as follows:

"There has been taking place almost insensibly in biological science, these last decades, a change of emphasis not well appreciated even by the biologists. The theory of evolution no longer is regarded as something to be proved. This has been done. Instead, the essentials of the theory now may be accepted as guiding principles in explaining other facts still unclear or in exploring other circumstances still unknown. If the anatomist finds, for example, some bodily organ or structure apparently useless to its modern possessor, it is legitimate for him to assume that this organ once was necessary and that some change in the habits or circumstances of the species has lessened its utility. The familiar example is the human appendix. *The same principle should apply to this mystery of colds.* It is impossible to accuse Nature of deliberately aiding the invasion of men's throats or noses by harmful germs."

The author of this article probably did not actually forsee an early substantiation of his theoretical surmise, but it is nevertheless true that the uvula is the evolutionary agency involved and that its general recognition as such will render this "mystery of colds" far less enigmatical.

There is no pre-operative means of gauging the pathogenic culpability of the uvula in cases of marked susceptibility to the common cold. Neither its size nor any other observable characteristic affords a dependable index to the advisability of excision, for it has been found that an exceptionally small uvula may be a source of pronounced disturbance and that it is not the elongated type only that definitely contributes to lowered nose and throat resistance. Staphylectomy may therefore be considered a justifiable and advantageous procedure in practically all cases exhibiting aggravated catarrhal tendencies, its efficacy being determined by the thoroughness of the operation and not by the dimensions nor the consistency of the tissue removed.

Denunciation of this radical proposal may be dictated by popular prejudice, but a practical and reliable estimate of its alleged rationality and merits is readily available to every member of the profession. The means is extremely simple and clinical material everywhere abundant.

Staphylectomy is such a minor procedure that it hardly admits of a technical description. It exacts no unusual skill of the operator nor does it demand special facilities. The topical employment of cocaine, or larocaine (Roche), in sufficiently generous amounts renders the operation practically painless. The use of both hands being essential, it becomes necessary for the patient to manipulate the tongue-depressor, which he or she can be instructed to do even more expeditiously than a trained assistant. Active hemostatic measures have never been required, although the possibility of their need has at times been anticipated. Only a trivial amount of bleeding is ordinarily witnessed and spontaneous arrest usually takes place in from one to five minutes. In many instances there is practically no hemorrhage at all. Post-operative care is a negligible consideration, but patients have, when practicable, been kept under daily observation until the wound was fully healed. The importance of removing the uvula *in toto* cannot be too strongly emphasized, as no compromise between staphylotomy and *staphylectomy* will yield results clearly confirmatory of the original findings reported.

Superstitious aversion to complete removal of the uvula has for ages obscured the possibility of an epochal rhinolaryngological achievement, for only through the experimental

employment of staphylectomy would it be possible to glean the facts that are indispensable to success in the long attempted conquest of "colds" and related nose and throat disturbances. This obstructive prejudice, although universal, is entirely unwarrantable. Over two thousand staphylectomies have revealed not the slightest justification for it. In the hands of the writer the procedure in question long ago passed from the stage of experimentation to that of established clinical utility, the enormous scope of which will prove no less astounding to future investigators than it has in the course of this anomalous experience.

3600 *Pacific Avenue.*

INTESTINAL OBSTRUCTION CAUSED BY THE MESENTERY OF A MECKEL'S DIVERTICULUM.*

F. J. Kirby, M. D.,
and
N. E. Needle, M. D.,
Baltimore, Md.

1. The true or Meckel's diverticulum is due to the persistence or incomplete obliteration of the vitelline or omphalo-mesenteric duct.

It occurs in about 2 per cent of the bodies examined, and is more common in males than in females.

Other authors quote its occurrence in 4 to 6 per cent of abdominal cases coming to operation.

2. Cysts may develop from the vitelline duct, which up to the eighth week of embryonal life extends between the intestines and the yolk sac. If the duct remains patent, a congenital fistula, from which mucus and intestinal contents are discharged, persists after the cord separates.

If the umbilical end of the duct closes and the intestinal end remains open, a blind sac (Meckel's diverticulum), which empties into the ileum, persists.

If the intestinal end closes, and the umbilical end, from which the mucous membrane protrudes, remains open, an umbilico-vitelline diverticulum is formed.

If both extremities become closed but the intermediate part of the duct remains patent, a vitelline cyst (enterocystoma) forms as the secretion is poured out.

The walls of the cyst, like those of the fistulae and diverticula, are composed of regularly and irregularly arranged bundles of smooth muscle fibres.

They are lined with epithelium which corresponds histologically to either the adult or embryonal types of intestinal epithelium.

3. "The diverticulum is always single and arises from the ileum, from fifteen to forty inches above the ileo-cecal valve." In the majority of instances, Meckel's diverticulum is seen coming off from the ileum as a blind tube.

The length of the diverticulum varies from one to four inches; the average being about two and one-half inches. Cases have been reported in which the length was up to ten inches. In our case the tube measured four and one-half inches in length.

Fig. 1.—1. Mesentery of diverticulum. 2. Distended proximal ileum. 3. Point of constriction of bowel by mesenteric vessel. 4. Collapsed distal intestine. 5. Origin of diverticulum anti-mesenteric.

The symptoms of strangulation due to a Meckel's diverticulum are somewhat obscure; in fact, the correct diagnosis is rarely made before the abdomen is opened. Most cases are sent to hospital with the diagnosis of acute appendicitis, while a few enter with a diagnosis of intestinal obstruction.

Unless the pain and inflammation is near

*From the Surgical Department of St. Joseph's Hospital, Baltimore, Md.

the umbilicus, it is practically impossible to make the diagnosis prior to operation.

4. C. Leo mentions depression of the umbilicus, as a symptom of ileus due to a Meckel's diverticulum.

The primary symptom is pain, which is apt to be followed by nausea or vomiting. If constriction of a loop of bowel occurs, distention and constipation will result, with inability to have bowels move, and unless the lesion is attended to early, death results from peritonitis, dehydration, and exhaustion.

Patient—J. P., age twenty-nine, sent to St. Joseph's Hospital 9:30 P. M., March 22, 1932, with diagnosis of acute appendicitis.

History was that at noon that day he was taken with sudden acute pain in the abdomen in region of the right lower quadrant, associated with nausea and vomiting.

Vomited several times during the day. Pain persisted, subsiding at times, but aggravated at other times.

Patient stated he had had discomfort in the abdomen, constipation, gas, feeling of fullness in the neighborhood of the appendix for some time. No previous appendix attack could be recalled, and no definite dyspeptic symptoms.

No genito-urinary symptoms.

Has had measles, mumps, whooping-cough. No pneumonia, typhoid fever, scarlet fever or diphtheria.

Personal habits good; leads a regular life, does not use tobacco or liquor, and drinks very little coffee, no tea.

Physical examination: Patient is thin, somewhat under weight.

Teeth, tonsils negative, thyroid not enlarged.

Lungs clear, dullness of heart area not increased, sounds clear, no murmurs, no irregularities.

Liver dullness not increased; gall-bladder not palpable nor tender; spleen negative. No herniae.

Abdomen slightly distended, especially lower half; tenderness to pressure over the appendix and about the umbilical region. Abdomen soft. No rigidity.

Tympany was increased on percussion to left of median line of lower half of the abdomen, and tinkling and high pitch resonance note in this region was made out by auscultation.

Examination of urine negative.

Blood N. P. N. 35 mgm. per cent. Sugar, .085 mgm. per cent. White blood cells 8,200. Polymorphonuclears 82 per cent. Lymphocytes 18 per cent. Temp. 101—rectal.

Had a small bowel movement the day he entered hospital shortly after the onset of pain, and passed some gas. No further movement of bowels and no passage of gas since. Diagnosis made of intestinal obstruction.

Patient was taken to operating room at 10 P. M. Anesthetic was gas and ether.

Abdomen opened. A Meckel's diverticulum was found in the ileum thirty-six inches from the ileo-cecal junction. The distal end of the diverticulum was free, having its own mesentery, the vessels from which were coursing over the intestine distal to the diverticulum, and coming off from the mesentery by way of a portion of the small gut beyond the diverticulum, the mesentery constricting the bowel and causing the obstruction.

Fig. 2.

The proximal portion of the intestine and diverticulum were very much distended, while the portion of the intestine distal to the mesenteric band was collapsed. Free clear serous fluid was found in the abdomen.

The vessels of the mesentery to the diverticulum were ligated and cut through close to their origin, which immediately relieved the obstruction. The diverticulum was then excised and the intestine closed over by suture.

As requested by patient, the appendix was then removed and the abdomen closed.

Patient returned to bed in good condition.

Convalescence was uneventful, patient making a complete recovery. Blood Wassermann

negative. X-ray visualization of gastro-intestinal tract before leaving hospital showed no further lesion.

REFERENCES

1. Frederick Treves: Intestinal Obstruction—Its Varieties. Wm. Wood & Co., New York, 1900.
2. Erich Lexer-Bevan: General Surgery.
3. Frederick Treves: Intestinal Obstruction—Its Varieties. Wm. Wood & Co. New York.
4. C. Leo: *Archv. Ital. di Chirurg.*, 28:531-545, 1931.
5. J. Alfred Gaynor: *Brit. Med. Jour.*, page 351, February 28, 1931.
6. Ralph B. Bettman: *Surg. Clinics. N. America*, 1930.
7. H. Blacom Yates: *Brit. Med. Jour.*, page 456, 1930.
8. A. C. Christie: *Jour. Diseases Children*, 42:544-553, 1931.

110 East North Avenue.

PREVENTABLE CANCER AND CURABLE CANCER AND THE VALUE OF ACCURATE MICROSCOPIC DIAGNOSIS IN THE OPERATING ROOM.*

JOSEPH COLT BLOODGOOD, M. D.,
Baltimore, Md.

The following statements are based upon the report of this illustrated address by a very intelligent young reporter of the *Daily Press*, Newport News, Va. What appears in quotation marks are actual quotations from the written and printed statements of the reporter; anything that appears in brackets are additional statements of the writer or corrections.

"There is enough knowledge of cancer (today) to prevent cancer of the mouth, the skin and the cervix (of mothers) and to cure much (much more) of the other forms of cancer" . . .

. . . "The problem is one of education of the public and the continued education of the medical (and dental) professions. Contrary to the general belief, it is not only the average medical practitioner, but the specialist as well who needs education" . . .

. . . "A series of lantern slides, some showing sections of cancerous tissue and of non-cancerous tissue which had been believed to be cancerous and others showing views of cancers in various parts of the human body before removal." (This reporter grasped and recorded the most important statements when I showed my lantern-slide illustrations, especially the microscopic of border-line tumors so frequently diagnosed malignant when they were really benign. This is especially true of lesions of the breast due to chronic cystic mastitis, that is, we are making the same mistakes today with the microscope that Sir Ashley Cooper called attention to one hundred years ago when he stated that many of his colleagues removed the entire breast for tumors that were not cancer. I have just sent to a colleague of mine some reprints and references to the mistaken statements that chronic cystic mastitis is a precancerous lesion. The title of my colleague's paper is: The Evolution of Cancer from Benign Lesions of the Breast, Cystic and Papillomatous. In 1903, I unfortunately published an article entitled Senile Parenchymatous Hypertrophy (a then new name for chronic cystic mastitis) in which I stated that perhaps in 10 per cent of the cases malignancy was associated with, or started in, chronic cystic mastitis. In 1883 Réclus, of France, and in 1893 Schimmelbusch, of Germany, made the first original contributions in which they both expressed the opinion that chronic cystic mastitis was largely a precancerous lesion and that the chance of development of cancer was at least 50 per cent. Their two articles and mine were unfortunately accepted by the large majority of pathologists and surgeons of the world. An intensive study of my own between 1903 and 1920 led to the publication of a monograph in the *Archives of Surgery* (Vol. III. pp. 445-542) in which I presented evidence making my former statement in 1903 incorrect and disagreeing with the conclusions of Réclus. Schimmelbusch and the majority of writers on this subject since.

In the *American Journal of Cancer* (Vol. XVI, No. 1—January, 1932) I again presented the evidence based on a restudy of all these border-line cases that chronic cystic mastitis is not a precancerous lesion, and that there is no more reason to perform the complete operation for cancer or to remove one or more

*Written June 16, 1933. Address delivered before the Hampton Roads Medical Journal Club, Elizabeth Buxton Hospital, Newport News, Va., May 26, 1933.

breasts, than there is to do so for an encapsulated adenoma, or a normal breast. In a certain per cent of cases it may be necessary to explore the palpable lump or one lump in a lumpy breast for a biopsy. But when the biopsy shows chronic cystic mastitis, no further excision is necessary. It is so difficult in some cases, except for a specially trained pathologist, to differentiate certain microscopic pictures of chronic cystic mastitis from cancer, that it may be necessary for the surgeon to excise the suspicious zone only and request the pathologist to send sections to a number of surgical pathologists of known and outstanding experience with this disease.

In 1915 a majority of pathologists diagnosed this border-line lesion malignant. Fortunately, today the majority diagnose it benign. When two good pathologists disagree on the microscopic interpretation of a breast lesion, the chances are that it is not malignant. A reasonably well-trained pathologist practically never fails to recognize a cancer of the breast.

I advise the readers of this article to familiarize themselves with the illustrations in the *Archives of Surgery* (Vol. III, pp. 445-542) and in the *American Journal of Cancer* (Vol. XVI, No. 1, January, 1932).

"Accurate diagnosis of cancer was emphasized as of extreme importance and measures of accurate diagnosis which have been developed during the past few years were described. He said: No operation for suspected cancer should be performed without microscopic examination in the operating room which would enable the surgeon to determine definitely whether the actual cancer was present; if so, what type of cancer, and the exact method of treatment to be employed, and whether any treatment would be effective.

(This reporter grasped the full meaning and extent of my statement in regard to the value of frozen-section diagnosis in the operating room, because many of us today are using this not only for the diagnosis whether the mass is cancer or not, but of its grade of malignancy, and whether, in some instances, it would seem wiser not to do the complete operation, but try radium treatment first. The reporter did not grasp a statement in which I emphasized that we can use the frozen section to study the tissue passed through in exposing the palpable lump and to establish that the malignant disease has been given sufficient margin in its removal.)

"In addition, he emphasized the value of making more than one microscopic examination with different stains, citing cases (a case) where this had proved that suspected cancer was not cancer at all. (This was the first time I ever made this statement. A few weeks before it was made I examined a patient with a lump the size of a pea in the subcutaneous fat in the midzone of the outer hemisphere of the left breast. It felt too superficial to be in the breast itself. Yet, the little nodule did not have the connection with the skin almost always present in a dermoid. The nodule had been observed by the patient but two weeks. It was neither painful nor tender. The woman was over thirty-five, unmarried, and there was no palpable evidence of chronic cystic mastitis in either breast. That is, the breasts were neither shotty, nor lumpy, and there were no dilated ducts beneath either nipple. This little definite, palpable, single nodule transilluminated dark. This excluded a benign cyst or a colloid cancer, but did not exclude a definite cancer or a cyst containing a papilloma and blood, or a hemorrhagic area. The palpable area was excised under novocain with a good margin of tissue. The lump itself was buried in subcutaneous fat. The breast tissue cut through was normal. The gross section of the little lump did not suggest malignancy. The tumor was distinctly different from the surrounding fat; there was no capsule. It looked more like a gumma or an area of fat necrosis. The first frozen section stained rapidly and without any preliminary fixation had the cellular picture of cancer. All of my associates and special students in surgical pathology thought that it was cancer in spite of seeing one or more giant cells. We then made a frozen section with hematoxylin and eosin and recognized a cellular picture in which there was no evidence of malignancy, but of a cellular inflammatory lesion with numerous foreign body giant cells and fat necrosis. I am convinced that for these doubtful and border-line cases we must use today more than one stain. First, we will make a frozen section without fixation and stain it with one or more stains; then we will make a frozen section of a bit of tissue hardened by boiling in formalin or some other means. (We will continue to search for a differential stain). By this proceeding in this case we saved the

breast, performed a minor operation, closed the wound, and the patient left for home that afternoon by motor. Studies of stained fixed tissue confirmed the diagnosis of benignancy.)

(I was tremendously impressed that this layman, a newspaper reporter in a small town caught and recorded one of the most important statements in my lecture.)

"Showing a picture of an aged woman operated on for cancer," he said: "This is why some surgeons save so many more cancers than others. This woman did not have cancer at all." (This was the photograph of a woman taken in 1932 showing the result of the complete operation for cancer of the breast by Dr. Halsted in 1892. The woman had a large lump in the left breast and a retracted nipple. I am confident, from Dr. Halsted's description, that the breast was shotty, because he states that more than a hemisphere was involved; that the cancer mass had a distinct edge like a liver, and, in addition to induration, there were shotty nodules throughout. Dr. Welch made a definite gross description of what I later described and what Broedel painted in 1901, and which I published in 1903 as cancer in senile parenchymatous hypertrophy. Welch, in his written report, called it adenocarcinoma, and records that the glands were not involved. With one exception, all the women living in 1930 who were operated upon in Halsted's clinic in Johns Hopkins for lesions of the breast, were diagnosed then chronic cystic mastitis, or were chronic cystic mastitis diagnosed malignant.

One patient operated on in 1895, diagnosed by Welch as colloid cancer with metastasis to the glands, lived twenty years free from any recurrence, then developed a nodule in the apex of the axilla, which could not be completely removed because it involved and surrounded the vessels and nerves. This patient lived in comfort until 1930, fifteen years later. There had been treatments, first, by the ordinary X-ray machine, then deep X-ray therapy. Fifteen years, therefore, after the second operation there developed lymphoedema and paralysis of the arm. The arm was amputated for comfort in 1932, and the patient died of a secondary erysipelas contracted after leaving the hospital. Czerny, the great German cancer specialist and surgeon, stated that every large surgical clinic should see at least one spontaneous cure of cancer of the breast every fifty years.

I have demonstrated that the majority of women living today, apparently free from the disease, operated on more than thirty years ago on the diagnosis of cancer of the breast, did not have cancer. We have one patient living today, twenty-five years after operation for cancer of the breast, free from recurrence; the base and mid-glands had been involved. A re-study of the well-preserved sections proved this.)

"Dentists were invited to this meeting as well as physicians, and a special set of lantern slides for the dentists were shown. Dentists," he said, "are equipped by training for the treatment of mouth cancers (the earliest stages), but not so well equipped for diagnosis. For this reason, every Medical Arts building should house a pathologist, so that dentists should have available frozen sections. He showed a view of a diseased tooth which, as later developed, was cancerous, and the man died. In any case where there is a suspicion of cancer and," he said, "the symptoms of incipient cancer and certain other mouth diseases are identical, and microscopic examination is the only sure method of diagnosis, the dentist should take sections of the tissue or put the tooth in formaldehyde and send it to a pathologist for examination."

(I was attempting here, with lantern slides, to illustrate to dentists and physicians that ultimately all cases of malignant disease beginning in the region of the jaws, or in the lining of the mucous membrane of the mouth, will be seen by dentists first. Dentists should therefore be educated in the proper recognition of these lesions in their early stages. The first sign of a lesion of the jaw, whether malignant or not, is pain in the region of the tooth or the jaw, a loose tooth, a swelling of the gum, or a swelling of the jaw. The first thing to do is to take X-ray films of the teeth and larger X-ray films of the jaw from more than one direction, and of both sides for comparison. If these pictures show anything suspicious of malignancy, the next most important procedure is to get a microscopic diagnosis by a competent pathologist. This will be found fully described in the System of Surgery edited by Dr. Dean Lewis (vol. iv, chapter iv). Special articles are being published in the *Journal of the American Dental Association*, *the International Journal of Orthodontia*, *Oral Surgery and Radiography* and in

Dental Survey (June, 1933, page 32). I am trying to emphasize that the operating dentist requires more and more frequently the aid of a surgical pathologist, and where they are grouped together in a Medical Arts Building, there is no difficulty in obtaining it.)

(In doubtful cases there is no difficulty in dropping the extracted tooth in 10 per cent formalin and sending it at once to a pathologist who will scrape the tooth, make a section of the soft tissue adherent to it, and determine at once whether malignancy is present. In my experience, if a loose tooth is extracted from a malignant area, malignant tissue will be always attached to the tooth. The dentist, in such suspicious cases, after the extraction of the tooth, can cauterize the socket. There is a very efficient electric cautery which can be purchased for twelve or fifteen dollars. This cauterization is not painful and not harmful to healing.)

"Moles (pigmented)," he asserted, "represented a source of danger and should be removed during adolescence. He showed views of moles that had been neglected and had caused the patient's death from cancer, saying: 'When a mole begins to weep, it is time for the family to weep.'"

(This lantern-slide demonstration, which I gave in the beautiful library of the Elizabeth Buxton Hospital, is one that I have been arranging for at least ten years, attempting to improve it from time to time with new material. Its greatest pictorial and teaching value is when four lanterns and four screens are provided. This allows each statement to be illustrated by four pictures. The object is to contrast the little things in which cancer may develop, which the well-informed patient brings to his physician or dentist to see in time, with the same little thing neglected because of ignorance, and what it looked like after this dangerous delay).

"Cancer," he said, "is a local disease in the beginning, and, in fact, is not malignant in the beginning." He said, "a cell does not become malignant until it has passed through an intermediate stage which is also not malignant, yet, in this stage, can be recognized as an incipient cancer and successfully removed."

(It is on this fact, which is accepted by the majority, if not by all cancer students, that the hope of preventing cancer of the skin, the mouth, and the cervix in mothers, depends, and when we can educate all people to periodic examinations and reporting to their physicians or dentists the moment they are warned between such examinations, cancer will be displaced as a second cause of death to an insignificant position in the mortality statistics.)

"Continued health," he asserted, "depends upon continued medical supervision." (I got this statement, "continued medical supervision," from Professor Freeman, of the School of Hygiene and Public Health, of Johns Hopkins University.) "For example," he said, "every mother should have an examination six months after the arrival of every child, and this would enable the physician to check and cure cervical cancer in every case. Only 10 per cent of women (mothers) have this protection." He said, "when this examination showed a suspicious condition (of the cervix) the general practitioner should send the patient to a pathologist (specialist), and, if cancer is found, its type should be determined and the patient should be referred to the proper specialist (radiotherapeutist). "This course," he declared, "is followed in every case of suspected cancer." (I have the written opinion of more than one thousand fellows of the American College of Surgeons who specialize in obstetrics, gynecology or both, and many other specialists throughout the civilized world. With few exceptions they agree that the mother should be instructed during the post-natal stage on the importance of returning for a pelvic examination within six months or one year, and then at definite intervals depending upon the findings of the last examination. Practically without an exception any member of the medical profession should recognize, by a good light and a speculum, a suspicious cervix after the birth of a child. This patient can be at once referred to a gynecologist, or an obstetrician, in his office, or a clinic, or a dispensary, or a hospital. Then the decision as to the removal of a piece for microscopic study can be made. And, when the microscope reveals beginning cancer, radium offers more than 90 per cent of a cure. The best results today in the largest clinics of the world, after the best radium and X-ray treatment of cancer of the cervix, is less than 35 per cent. The chief, or perhaps, the only cause is delay due to ignorance.)

"The only reason it is not followed," he said, "is lack of organization." (There is no question that we have the knowledge today, the specially trained members of the medical

and dental professions, the pathologist for diagnosis, the skilled operators, the radiotherapeutists, sufficient radium and X-rays. What we lack is the education of more people and the better education and cooperative organization of the medical and dental professions. It is my opinion that the press at the present moment can be of the greatest help in the dissemination of this correct information, both to the public and to the professions, and when the women of this country really understand preventive medicine and the tremendous improvement in modern medicine, in diagnosis and cure, they will demand that their families and their communities be given the benefits of all these things, and there will be no difficulty in the medical and dental professions in meeting these new requirements.)

3301 *North Charles Street.*

STUDIES ON THE UTILIZATION OF DICALCIUM PHOSPHATE AND CALCIUM INOSITOL-HEXAPHOSPHATE BY RATS.

J. C. Forbes, M. A., Ph. D.,
Department of Biochemistry, Medical College of Virginia.
Richmond, Va.

Studies on the effect of dietary alkalinity on the absorption of calcium and phosphorus from the intestinal tract have not led to comparable results. Zucker, Johnson, and Barnett[1] have shown that an otherwise nonrachitic diet could be made rachitic by the addition of 2 per cent sodium carbonate. The alkali presumably prevented adequate calcium and phosphorus absorption through their precipitation as tricalcium phosphate in the intestinal tract. Sato[2] found sodium bicarbonate to have a detrimental effect on calcium assimilation by children. Telfer[3] believes that the absorption of calcium is dependent on the free acid of the gastric juice and tends to be retarded by the alkaline reaction of the intestinal juices. On certain diets the absence of vitamin D is known to cause an increased alkalinity of the feces of rats, and when the vitamin is again given the feces revert, at least temporarily, to a more acid reaction.[4-5-6-7-8-9] Shohl and Bing[10] found that although on certain diets the cure of rickets was associated with a change in the pH of the feces from alkaline to acid, such a change in the feces did not necessarily result when the rachitic lesions were cured with other diets.

Artificial acidification of the intestinal tract was found by Irving and Ferguson[11] to increase calcium absorption, at least, as measured by increase in blood calcium. Flood[12] obtained improvement in the rachitic condition of children by the administration of hydrochloric acid. Samuel and Kugelmas[13] have shown, however, that in the absence of vitamin D, rickets develops far more rapidly and more severely in rats when the diet is acid forming than when it is neutral or base forming. Brown et al[14] obtained similar results, and further showed that, although the acid-base balance is a factor in the development of rickets, the Ca : P ratio seems to play the most important role. Jones[15] found excess alkali in the diet to cause retrograde bone changes and development of rickets in puppies. Neutralization of the excess alkali initiated the healing process. On the other hand, Cole, Speer and Heyl[16] found base forming diets favored calcium and magnesium retention and also possibly phosphorus retention. Givens and Mendel[17] were unable to demonstrate any detrimental influence of sodium bicarbonate on calcium, magnesium and phosphorus retention in dogs. Farquharson et al[18] found a daily intake of 12 grams of sodium citrate had no unfavorable effect on calcium and phosphorus retention in adults.

The purpose of the present investigation was to compare the effect of marked dietary alkalinity on the utilization, by rats, of the calcium and phosphorus of dicalcium phosphate with that of an organic calcium phosphate compound. A commercial preparation known as calciphos was used for this purpose since its Ca : P ratio is approximately the same as that of dicalcium phosphate. It was felt that since the solubilities of these two substances in water of various hydrogen ion concentration are quite different, then, if absorption is primarily dependent on intestinal acidity, manifest differences in their utilization might be obtained. Comparative solubility determi-

nations at 37° in acetate buffer solutions gave the following results. Calcium values are expressed in milligrams per 100 c.c. of solution.

pH 7.6		pH 6.7		pH 6.0	
$CaHPO_4$	Calciphos	$CaHPO_4$	Calciphos	$CaHPO_4$	Calciphos
0.8	6.6	9.7	8.1	23.7	13.6

It will be seen that in the more acid solutions dicalcium phosphate is much more soluble than calciphos, while the reverse holds true in alkaline solutions. The acid acetate solutions were all prepared from a 10 per cent solution of sodium acetate by the addition of a small amount of acetic acid. In the case of the solutions of pH 7.6 the calcium salts were shaken with 10 per cent sodium acetate for six hours, after which the pH was adjusted to 7.6 by the addition of sodium hydroxide.

Calciphos is prepared from the steep-water of corn by the addition of a soluble calcium salt until precipitation occurs. It is theoretically a saturated calcium salt of inositol hexaphosphoric acid, but contains impurities. Chemical analysis indicates the following average composition: calcium 19.8 per cent, phosphorus 14.1, magnesium 2.5, nitrogenous substances 5.5 per cent. It contains traces of inorganic phosphates, is neutral in reaction, tasteless, and quite insoluble in water.

Diets: The various diets used were prepared from a stock diet having the following composition:

	Grams
Yellow corn meal	720
Meat meal	103
Dried milk	52
NaCl	5
KCl	2.5
Magnesium lactate	17.5

Some ferrous sulfate and trace of potassium iodide.

Dicalcium phosphate or calciphos was added to the stock diet in sufficient amounts to give an adequate calcium and phosphorus content. In the early experiments Wesson oil was added to the extent of 10 per cent of the diet so as to increase the fat content. This, however, was discontinued in the later experiments as it was found to slowly hydrolyze and react with the sodium carbonate used in some of the experiments. Diets 1, 2, 3 and 4 are calciphos diets. Diets 1 and 2 contained 10 per cent Wesson oil, but diet 2 contained in addition 2 per cent anhydrous sodium carbonate. Diets 3 and 4 are exactly comparable to diets 1 and 2, respectively, except that they contained no Wesson oil. Diets 5, 6 and 7 are dicalcium phosphate diets. Diets 5 and 6 contained 10 per cent Wesson oil, but diet 6 contained in addition 2 per cent sodium carbonate. Diet 7 is similar to diet 6 except that it contained no Wesson oil. The calcium content of the various diets varied from 426 to 516 mgms. per 100 grams of diet, the phosphorus content from 488 to 544 mgms. Five drops of cod liver oil per cage were fed daily.

Procedure: The rats, two in a cage were kept in round metabolism cages supported on large glass funnels, fine wire netting being placed underneath the funnels to retain the feces while the urine passed through to beakers underneath. Urine and feces were collected at weekly intervals. In collecting the urine the sides of the funnels were washed down with dilute hydrochloric acid and water to dissolve any precipitated salts adhering to the sides. The feces were collected in weighed beakers, dried in an oven at 110°, weighed, finely ground and mixed, after which aliquot samples were taken for analysis. Food consumption was determined per period. Any food spilt was usually collected with the feces and analyzed as such. In a few instances, where excessive amounts were spilt, it was reasonably well separated from the feces, dried at room temperature, weighed, and the weight subtracted from intake to obtain actual food consumption.

Method of analysis: Morris, Nelson and Palmer's method[19] was followed in the analysis of both food and feces. Urine, after acidifying if necessary, was diluted to a definite volume, filtered, and aliquots taken for analysis. Calcium was precipitated as the oxalate, using brom-cresol purple as indicator and adding ammonium hydroxide to a dirty gray color or approximately pH 5.8. Urine calcium was always low, and consequently any error from the presence of uric acid or other impurities is negligible in calculating calcium retention. Inorganic phosphate was determined by Fiske and Subbarow's[20] method. Since the amount or organic phosphates in urines is normally very low, it is felt that any error from this source is inconsequential in calculating phosphorus retention.

Discussion: It will be seen from the experimental results that the addition of 2 per cent sodium carbonate to the diets did not have any

detrimental effect on calcium and phosphorus utilization, except possibly in very young rats, (cage 3, Table 2). It is probable that even in this case the effect was due more to a diminished palatability of the diet than to an actual effect on calcium and phosphorus utilization, since these rats as well as those in cage 2, Table 2, tended to scatter their food. It was found impractical in these cases to separate completely the scattered food from the feces; consequently, the recorded per cent retention is too low. There was no marked scattering of food in any of the other experiments, even in those in which sodium carbonate was used. A considerable degree of rancidity developed in the Wesson oil diets; consequently, most of the sodium carbonate used in experiments 2 and 3, Tables 1 and 2, was converted into sodium soaps before the end of the experiments. This, although changing the true dietary alkalinity, did not affect the potential alkalinity. In experiments 4 and 5, Table 1, and experiment 4, Table 2, no fats were present except the small amount in the milk and meal. The sodium carbonate consequently remained unchanged in the diet, at least to a very great extent, during the course of the experiments.

A comparison of the data in Tables 1 and 2 shows a slightly greater rate of growth and calcium retention by the calciphos fed rats

TABLE 1

Effect of Sodium Carbonate on the Utilization of Calciphos by Growing Rats

Period	Average Weight, grams.	Cage	Average Daily Intake, mgms.		Average Daily Retention, mgms.		Per Cent Retained		Remarks
			Ca	P	Ca	P	Ca	P	
1	48	1	39	42	25	17	64	40	Diet 1 contained 10 per cent Wesson oil. No Na_2CO_3. Two male rats.
2	83	.....	53	57	35	23	66	58	
3	120	.....	56	60	34	22	61	37	
4	145	.....	62	66	39	29	63	44	
5	173	.....	63	67	40	31	63	46	
			Average.....		35	24	63	45	
1	46	2	37	40	24	20	65	50	Diet 2—same as above except that it contained 2 per cent Na_2CO_3. 1 male, 1 female rat.
2	78	.....	42	45	27	18	64	40	
3	91	.....	49	52	31	20	63	38	
4	115	.....	48	51	31	18	65	35	
5	138	.....	52	56	35	25	67	45	
			Average.....		30	20	65	46	
1	48	3	35	37	22	18	69	49	Diet same as in cage 2, 2 female rats.
2	77	.....	50	53	33	24	66	45	
3	101	.....	50	53	30	15	60	28	
4	119	.....	49	52	30	18	61	35	
5	135	.....	49	52	28	19	57	36	
			Average.....		29	19	63	39	
1	72	4	37	46	21	18	57	39	Diet 3 contained no Wesson oil or Na_2CO_3. 2 male rats.
2	105	.....	60	75	39	33	65	44	
3	141	.....	63	78	38	20	60	26	
4	173	.....	62	77	37	34	59	44	
5	206	.....	63	78	33	25	54	32	
6	223	.....	64	80	28	17	44	21	
			Average.....		33	24	56	34	
1	66	5	36	45	22	17	61	38	Diet 4—same as diet 3 except that it contained 2 per cent Na_2CO_3. 1 male, 1 female rat.
2	94	.....	51	64	35	33	69	52	
3	114	.....	52	65	34	20	65	31	
4	141	.....	61	75	34	31	56	41	
5	166	.....	59	73	33	26	56	36	
6	189	.....	65	82	27	21	41	26	
			Average.....		31	25	58	37	

XUM

over those of corresponding sex receiving dicalcium phosphate. The per cent retained was, however, approximately the same in both cases, indicating that either of these salts serves equally well as sources of calcium and phosphorus for growing rats. The absence of any detrimental effect of the alkali on the utilization of these salts is of interest in view of their different solubilities in water of various hydrogen ion concentrations. If one assumes that the hydrogen ion concentration of the intestinal tract is the most important factor in determining the solubility and absorption of calcium compounds, then dicalcium phosphate should be better utilized than calciphos when fed with normal diets, which presumably would give normal reactions of the intestinal tract. The negative effect of the alkali when fed with either salt may conceivably be due to the rats compensating for the excess alkali by increased acid excretion into the stomach, so that the reaction of the intestinal tract did not change. However, pH determinations of the feces on several occasions showed a distinct alkaline reaction in those receiving sodium carbonate and an acid reaction in those on the normal diet.

Since these two salts are equally well utilized from both normal and markedly alkaline diets, in spite of their different solubilities in water solutions of various hydrogen ion concentrations, one must assume that there are other factors, beside the pH of the intestinal tract, which are important in determining their solubility in, and absorption from, the intestines. Some of these factors are possibly bile, fatty acids and inorganic salts.

TABLE 2

Effect of Sodium Carbonate on the Utilization of Dicalcium Phosphate by Growing Rats

Period	Average Weight, grams.	Cage	Average Daily Intake, mgms.		Average Daily Retention, mgms.		Per Cent Retained		Remarks
			Ca	P	Ca	P	Ca	P	
1	42	1	31	33	22	18	71	54	Diet 5 contained 10 per cent Wesson oil. No Na_2CO_3. 2 male rats.
2	61	.....	39	41	25	23	64	56	
3	85	.....	47	50	30	26	64	52	
4	112	.....	46	49	28	22	61	45	
5	.....	.....	47	50	32	25	68	50	
6	153	.....	50	53	35	29	70	55	
			Average		29	24	66	52	
1	40	2	48	50	31	25	65	50	Diet 6—same as above except that it contained 2 per cent Na_2CO_3. 1 male, 1 female rat.
2	63	.....	49	51	23	31	47	60	
3	74	.....	37	39	27	16	73	41	
4	87	.....	44	47	23	13	52	28	
5	.....	.....	47	50	24	16	51	32	
6	116	.....	50	53	30	20	60	38	
			Average		26	20	58	41	
1	29	3	28	29	18	10	64	34	Diet same as in cage 2. 2 female rats.
2	48	.....	35	37	7	9	20	24	
3	59	.....	39	41	21	13	54	32	
4	76	.....	44	47	19	13	43	28	
5	.....	.....	49	52	26	16	53	31	
6	109	.....	43	46	31	21	72	46	
			Average		20	14	48	32	
1	58	4	32	39	21	16	66	41	Diet 7 contained no Wesson oil, but contained 2 per cent Na_2CO_3. 1 male, 1 female rat.
2	77	.....	42	51	27	24	64	47	
3	100	.....	51	62	33	18	65	29	
4	123	.....	49	59	28	18	57	30	
5	146	.....	56	68	35	33	62	48	
6	167	.....	52	62	20	17	38	27	
			Average		27	21	59	37	

SUMMARY

It has been shown that a saturated calcium salt of inositol phosphoric acid serves equally as well as dicalcium phosphate as a source of calcium and phosphorus for growing rats.

Addition of sodium carbonate to the extent of 2 per cent to the diet did not appreciably, if at all, affect calcium and phosphorus utilization.

Note.—The calciphos was supplied by Dr. T. B. Wagner, New York City. A part of the investigative expenses was met by a grant from the Valentine Research Fund of our institution.

REFERENCES

1. Zucker, Johnson, and Barnett: Proc. Soc. Exp. Biol. Med., 20,20, 1922-23.
2. Sato: *Am. J. Dis. Child*, 16,293, 1918.
3. Telfer: *Quart. J. Med.*, 17,245, 1923.
4. Zucker and Matzner: Proc. Soc. Exp. Biol. Med., 21,186, 1923.
5. Jephcott and Bacharach: *J. Biol. Chem.*, 20, 1350, 1926.
6. Grayzel and Miller: *J. Biol. Chem.*, 76,423, 1928.
7. Abrahamson and Miller: Proc. Sov. Exp. Biol. Med., 22,438, 1924-25.
8. Redman, Willimott, and Wokes: *J. Biol. Chem.*, 21,589, 1927.
9. Courtney and Tisdal. *J. Can. Med. Assoc.*, 19,559, 1928.
10. Shohl and Bing: *J. Biol. Chem.*, 79,269, 1926.
11. Irving and Ferguson: Proc. Soc. Exp. Biol. Med., 22,527, 1925.
12. Flood: *Am. J. Dis. Child*, 32,550, 1926.
13. Samuel and Kugelmas: *Am. J. Dis. Child.*, 39,687, 1930.
14. Brown, Shohl, Chapman, Rose, and Saurwein: *J. Biol. Chem.*, 98,207, 1932.
15. Jones: *Am. J. Physiol.*, 79,694, 1926-27.
16. Cole, Speer, and Heyl: *J. Am. Pharm. Assoc.*, 18,107, 1929.
17. Givens and Mendel: *J. Biol. Chem.*, 31,421, 1917.
18. Farquharson, Salter, Tibbetts, and Aub: *J. Clin. Inv.*, 10,221, 1931.
19. Morris, Nelson, and Palmer: *J. Ind. Eng. Chem.*, Analytical Edition, 3,164, 1931.
20. Fiske and Subbarow: *J. Biol. Chem.*, 66,375, 1925.

Mother's Day.

The Maternity Center Association announces that an important step forward in the effort to save mothers' lives will be taken in 1934. Mother's Day—May 13th—is to be observed throughout the country by local groups determined to know precisely what their own maternal facilities are; how they can be improved; how to improve them. Forms for making local surveys to appraise what exists and suggest improvements are available on application to the Maternity Center Association, 1 East 57th Street, New York City.

Woman's Auxiliary, to the Medical Society of Va.

President—MRS. WILLIAM LETT HARRIS, 1112 Matoaka Street, Norfolk.

President-Elect—MRS. JOSEPH BEAR, 3012 Monument Avenue, Richmond.

Recording Secretary—MRS. FLETCHER J. WRIGHT, 49 South Market Street, Petersburg.

Corresponding Secretary—MRS. CHARLES A SAUNDERS, 1000 Gates Avenue, Norfolk.

Treasurer—MRS. REUBEN F. SIMMS, 2034 Park Avenue, Richmond.

Executive Board Meeting.

The mid-winter executive board meeting of the Woman's Auxiliary to the Medical Society of Virginia, met Friday, February 23, 1934, at eleven-thirty in the morning, in Norfolk, at the home of the President, Mrs. William Lett Harris.

The meeting was opened by a prayer by Mrs. Harris, followed by roll call. There were twenty-three present—nineteen board members and four members of State committees.

The Treasurer, Mrs. R. F. Simms, reported a balance on hand of $81.23. She asked that State dues be sent to her this year by September 15th.

The Corresponding Secretary, Mrs. C. A. Saunders, reported that several letters had been sent out by her.

The Organization Chairman, Mrs. Joseph Bear, reported that two new Auxiliaries had been organized, one in the Mid-Tidewater section, with Mrs. Hawes Campbell as President, and the other in Lynchburg, with Mrs. F. O. Plunkett as President. The Mid-Tidewater Auxiliary will hold its first regular meeting later in the spring.

Mrs. C. L. Harrell, State *Hygeia* Chairman, read an excerpt from the January news letter of the A. M. A. Auxiliary, in which the President, Mrs. James Blake, stressed the practical value of *Hygeia*.

The Revisions Chairman, Mrs. E. L. Lowenberg, recommended that additional copies of the State Constitution be made for the benefit of new Auxiliaries. Mrs. Bear made this a motion, seconded by Mrs. Southgate Leigh. It was suggested that these copies be mimeographed ones, and the Chairman of Printing, Mrs. H. R. Drewry, was so instructed.

The Publicity Chairman, Mrs. W. T. Sanger, sent word to the meeting that she would like to have news from each Auxiliary by the 12th of each month.

Mrs. C. J. Andrews, Courtesy Chairman, reported that she had written one letter of condolence, that to Mrs. Kirkland Ruffin, after the death of Dr. Ruffin. Dr. Ruffin was a Past President of the Medical Society of Virginia.

In connection with the exhibit work, Mrs. Harris read a letter from Mrs. Miner, National Chairman of Exhibits, asking that any outstanding piece of work be displayed at the National Convention.

The Chairman of the Junior Auxiliaries, Mrs. Franklin Wilson, reported that she had attempted to organize a Junior Auxiliary in Richmond, but they were not ready to form an Auxiliary at this time. She commended the Norfolk Junior Auxiliary for its help at various functions.

REPORTS OF COUNTY PRESIDENTS

Richmond. Mrs. J. B. Stone, President, reported a luncheon given by the Richmond Auxiliary to the five-point children of the State when they met in

Richmond. She reported that sixteen school children were furnished milk last year, and that this work would be continued.

Petersburg. Mrs. Philip Jacobson, President, reported a linen shower, sponsored by the Auxiliary, to the Post-Graduate Society, in which $800.00 worth of linen was furnished the hospital. She said that the Auxiliary hopes to make this an annual event.

Norfolk. In the absence of the President, Mrs. J. B. Abbitt, the President-elect, Mrs. E. L. Lowenberg, reported that draperies had been hung in the Medical Society auditorium by the Auxiliary, that two indigent cases had been helped, and that through the Public Relations Chairman, health movies were being given before other women's organizations.

Newport News. Mrs. W. S. Snead, President, reported a health lecture given in the public schools, the sponsoring of pre-natal work, the furnishing of layettes, and work with visiting nurses (T. B. cases mostly). She also reported that the Auxiliary had given out garments to storm sufferers. Mrs. H. W. Potter reported that from $50.00 to $90.00 would be realized from a moving picture sponsored by the Auxiliary.

Hampton. (Elizabeth City County Auxiliary). Mrs. J. J. Cullinan, President, reported that because of few members, the Hampton group would like to work in connection with the Warwick County Auxiliary (Newport News). After discussion, it was decided that this could be done.

Mid-Tidewater Group. Mrs. Hawes Campbell, President, asked for suggestions, and reported that she was getting organized for the first regular meeting in April.

A motion to accept the reports of the standing committee chairmen and county presidents was made by Mrs. C. J. Andrews, seconded by Mrs. H. R. Drewry, and carried.

The President announced that the A. M. A. Convention would be held in Cleveland, Ohio, June 11-14, 1934, and urged all who could to go. She appointed the following delegates: Mrs. Southgate Leigh, Norfolk; Mrs. Joseph Bear, Richmond, and Mrs. J. B. Stone, Richmond.

Mrs. Harris introduced the President of the Woman's Auxiliary to the Southern Medical Association—Mrs. Southgate Leigh.

Mrs. C. A. Saunders read the suggested outline of work which Mrs. Leigh had given at the Post-Convention Board meeting of the Woman's Auxiliary to the Southern.

A recommendation from the Woman's Auxiliary to the Southern that a Jane Todd Crawford Chairman be appointed in each State, was presented as a motion by Mrs. M. N. King, seconded by Mrs. Saunders, and carried.

Each Auxiliary was requested to hunt up and send in information desired by the Historian of the State.

The recommendations from the A. M. A. Convention for the State Auxiliaries were read by Mrs. M. N. King. (August, 1933, VIRGINIA MEDICAL MONTHLY.

THE RECOMMENDATIONS FROM A. M. A.

That each State appoint an Exhibit Chairman.

That Education Chairmen be appointed in all States, and that these chairmen study their duties in the Handbook.

That upon the payment of one dollar a year, the News Letter be sent to all County Presidents and Education Chairmen.

That the Study Envelope be published for the coming year to the extent of the budget.

That the Treasurers be more careful in returning the slips to the National Treasurer.

That the installment and use of filing cards be stressed in all Auxiliaries.

That the Auxiliaries inform themselves about the State and County Boards of Health.

That speakers' bureaus be formed by lay men and women who may be called upon to speak before groups on health programs.

That essay contests be held in schools, and given public recognition through the broadcast and the newspapers, and that physicians be the judges in these contests. That each State have a scrapbook.

The State Convention, to be held in Alexandria, October 9-11, was announced. After consideration, it was decided to plan all business meetings for one day, and to invite the Washington Auxiliary to attend meetings and to suggest speakers.

County Presidents were requested to appoint delegates to the State Convention, at the last meeting of each Auxiliary this spring.

The Chairmen of Standing Committees and County Presidents were instructed to send annual reports dated from April 1, 1933, to April 1, 1934, to the State President, by April 15th.

Mrs. Harris announced that the next State Executive Board meeting would be held in Alexandria, immediately preceding the regular annual meeting.

The Program and Health Chairman, Mrs. Southgate Leigh, introduced Dr. Thornhill, who presented two moving pictures on health topics. One advocated a yearly health examination, the other explained proper food and dieting. Both were most interesting. These moving picture films were loaned by the Metropolitan Life Insurance Company.

There being no further business, the meeting was adjourned.

Mrs. Harris then invited the board members and guests to luncheon at her home.

Respectfully submitted,

ALICE MOSS JONES,
(MRS. T. ELMORE JONES),
Acting Secretary.

The Milbank Memorial Fund

Announces that a plan of medical care for the American people, providing for more extensive prevention and treatment and more adequate payment for private physicians, will be proposed for public consideration as the result of their present studies. It is stated that this is being done on account of the unfinished work of the Committee on the Cost of Medical Care. Groups of physicians, dentists, nurses, and other experts are assisting the Milbank staff and boards of counsel, which also include many physicians, in the task of outlining the proposed program. The results of these studies and the new proposals will be published during this year.

Virginia Medical Monthly

Founded by LANDON B. EDWARDS, M. D., April, 1874
Owned by MEDICAL SOCIETY OF VIRGINIA since November, 1919
WYNDHAM B. BLANTON, M. D., *Editor*
AGNES V. EDWARDS, Richmond, *Business Manager*

PUBLICATION COMMITTEE
WYNDHAM B. BLANTON, M. D., Richmond, *Chairman*
J. H. NEFF, M. D., University H. A. TABB, M. D., Gloucester

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Monthly, 1200 East Clay Street, Richmond, Va.
This journal is not responsible for the opinions and statements of its contributors.
All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.
Subscription Price: $2.00 per annum in advance. Single Copies 25c.

VOLUME 61 APRIL, 1934 No. 1

Editorial

The Best Paid Man in the World.

The physician is the best paid man in the world. He is required to have an education which will be a benefit and a comfort to him all the days of his life. He wins a degree and he attains the honorable title of doctor. He learns to know more intimately his fellow man than anyone else can know his fellow. He gets praise for many things that he does not deserve and providence and disease are blamed for his mistakes. He wins the gratitude of those he serves. His charity work is invaluable to his experience. If he is reasonably conscientious and works reasonably hard he builds a practice that will insure him a good house, office and automobile and enable him to rear and educate a family and to stand the losses of the inevitably foolish investments he makes. If he has taste for invention there are innumerable unknown instruments and improvements awaiting him. If he wishes to discover, the laboratory is ready for him. If he likes research the facilities and libraries are available. If he craves adventure insidious dangers lurk around him and there are ever pioneer fields to enter. In his endeavors his government, his community and his fellow physicians stand ready to aid him. He is an advocate without a jury, a judge without a court, a minister without a surplice, a business man without guile, a farmer whose soil is the human body and whose crops are human health and happiness and he is a laborer without a boss. The physician is the best paid man in the world.

BEVERLEY R. TUCKER.

Dr. Tucker's remarks summon us to a sound way of thinking at a time when a threatened state license tax upon physicians has directed the thoughts of most of us to our pocketbooks, to our material rather than our spiritual position. His reflections challenge us to fresh adventures in contentment and happiness at a time when the hue and cry is loudest against the unfairness of expecting physicians to care for the indigent sick, to teach in state supported schools, and to minister to patients in clinics and hospitals—all without remuneration.

It can hardly be doubted that the American physician is the victim of an archaic method of handling one side of the community's obligation to the poor and unfortunate. In Russia where the new order has revolutionized medicine the slogan is "To Hell with Charity." Will the New Deal in this country see a saner conception of the relation of medicine and the physician to the care of the indigent sick? Until readjustment comes perhaps we do well to accept Dr. Tucker's appraisal of our status.

The Treatment of Peptic Ulcer.

Medical literature during the past year has been particularly full of new approaches to

the vexing problem of how to cure ulcers of the stomach and duodenum, and fresh evaluations of some of the more recently advocated measures have appeared from time to time.

Milk protein injected intramuscularly has had its advocates. Other foreign proteins have been given intravenously. Therapy of this type is based upon the theory that ulcer formation is due to the reaction of certain sensitized cells in the gastric mucosa to some specific antigen. The bacterial theory of the origin of ulcer has dictated its own therapeutic approach, which consists in the scrupulous removal of all demonstrable foci of infection and the building up of immunity through "ulcer vaccines." The vaccines are advocated in graduated bi-weekly doses over a period of from eight to ten weeks. Diathermy has been employed and favorable results reported. Applied to the cervical vagus and sympathetic nerves for thirty minutes in from five to fifteen treatments relief of symptoms is to be expected. The effect of such penetrating heat upon the vagus is said to be conveyed to the stomach where relaxation and lowered irritability follow. At the same time sympathetic tone is improved.

In methods aimed at reducing the sodium chloride intake and at the withdrawal of gastric juice the problem has been attacked from still another angle. In following this approach sodium chloride ingestion is kept below 1.2 gm. a day, while a permanent catheter in the stomach constantly drains away the gastric juice. Injection of salyrgan still further decreases the body chlorides through diuresis. Hardly less drastic is the continuous alkalinized milk drip by which through a retained stomach tube milk containing 5 gm. of bicarbonate of soda to the litre is allowed to run into the stomach at the rate of thirty drops a minute. Excellent results are reported from this procedure which is obviously aimed at the perplexing problem of constantly keeping down gastric acidity.

Mucin was enthusiastically advocated several years ago as an ideal antacid which possessed soothing, protective and lubricating properties. Recent reports emphasize the complaints of patients over its disagreeable, often nauseating taste, its failure in a number of instances to give even symptomatic relief, and the relapses that have disappointed those who were initially benefited. There still appears to be use for mucin in selected cases, but it should be employed in conjunction with the older standard methods of therapy.

Metaphen in the hands of certain investigators is said to relieve symptoms and cause disappearance of ulcers. Its action is thought to be bactericidal, but a drug which is 56 to 57 per cent mercury should not be given continuously and in large doses without due consideration of its possible toxic effects. The daily intravenous injection of .5 gm. of sodium benzoate has caused the subsidence of the typical ulcer symptoms, and okrin, the water soluble alcohol precipitable fraction of okra pods, when given in teaspoonful doses has been shown to accomplish the same results.

In a recent issue of *The American Journal of Surgery* (February, 1934). Felix Cunha reports favorable results from the intravenous use of Synodal administered every fourth day for ten doses. This preparation is a combination of lipoproteins and emetine. The proteins have been shown to lessen gastric peristalsis and to relieve spasm at the pylorus They have been thought to induce hyperemia of the gastric mucosa and to thus favor ulcer healing. Emetine is excreted slowly, is held to relax smooth muscle and pyloro-spasm, and is considered effective for its bactericidal properties at the site of the ulcer.

It is important to accept all reports of this character guardedly, remembering that they are still in the experimental stage. For the present, such methods of therapy should be restricted to carefully controlled patients.

A Virginia Medical Manuscript.

The Library of the College of Physicians of Philadelphia has recently been enriched by the acquisition of an important Virginia medical manuscript—John Mitchell's account of yellow fever as it existed in Virginia in 1741-42. Benjamin Rush carefully read this communication of Dr. Mitchell's, declaring: I "paused upon every sentence; even words in some places arrested and fixed my attention." Acting upon the information thus obtained he developed his treatment of yellow fever characterized by copious bleeding and heroic purgation. John Mitchell lived at Urbanna, Va., and cut quite a figure in his day, being known both in this country and in Europe as a physician, naturalist, cartographer and historian.

Exeunt Pompholyx and Eczema.

Advances in our knowledge of the dermatomycoses—the role of the fungi in remote as well as local manifestations of skin disease—

threaten among other things the position of pompholyx. Many dermatologists at present doubt the existence of such a clinical entity. Lesions once regarded as typical pompholyx are now explained as the allergic manifestations of a distant fungus implantation.

From time immemorial physicians have thrust into a pigeon hole labelled eczema all dermatitis of unknown origin, and the disease has assumed enormous importance in dermatological thinking. From this vulnerable position recent medical progress threatens to tumble it. Encroachment has come from at least two directions. In the growing recognition of the importance of the dermatomycoses it has become apparent that many cases of ringworm formerly masqueraded as one of several types of eczema. Fungus infections are easily the most common skin diseases encountered today. Another large group of skin diseases once classified as eczema are now properly attributed to allergic sensitization of the skin to foreign proteins in food, drugs and a host of environmental contacts. By such encroachments eczema as a skin disease has lost caste, but until there are no longer cases of dermatitis whose etiology is unrecognized use will still be found for that much abused term.

Department of Clinical Education of the Medical Society of Virginia

Courses in Prenatal and Postnatal Care Begin in the Valley.

Although the fewer than one hundred physicians in the counties of the northern Valley constitute a smaller professional population than that of the usual area for circuits of postgraduate classes in prenatal and postnatal care, five centers with a prospective enrollment of average size have been arranged by the Joint Committee on Prenatal and Postnatal Instruction. Dr. M. E. Lapham, of Philadelphia, the Field Clinician of the Joint Committee. begins his work in Harrisonburg, Luray, Front Royal. Woodstock and Winchester in the week of March 26th.

At the time the course was offered to the physicians, only two organized medical societies were concerned. The Rockingham County Society unanimously approved the course and authorized the president, Dr. N. M. Canter, to appoint a committee to take charge of local arrangements and to have the responsibility of furnishing clinical material. The Medical Society of Northern Virginia, at its meeting on November 20th, also unanimously approved the organization of the classes and committees representing each of the six counties concerned were appointed by the president, Dr. E. C. Stuart. Members of the newly organized Shenandoah County Medical Society have accepted the course as a valuable means of strengthening their unit.

In advance of the opening date groups of fair size have been established by these committes in Harrisonburg, Front Royal and Winchester. The definite organization of others was not so far advanced. but indications of interest on the part of many physicians with whom the Joint Committee was in communication warranted the expectation that future enrollments would be sufficient to justify these centers of instruction. The usual average of more than half of the physicians who are accessible to the centers and are practicing obstetrics will doubtless be maintained.

These courses of ten weeks in length will extend from the last week in March through May. They bring to a total of fifty the courses conducted in Virginia for the Joint Committee by Dr. Lapham, courses which have enrolled 600 physicians.

The schedule of meetings, with the committees in charge and with the advance enrollments, follows:

HARRISONBURG: The class meets on Mondays at 12:30 P. M. in the classroom of the Nurses' Home, Rockingham Memorial Hospital. Local committee in charge of membership and clinical material: Drs. A. C. Byers, B. S. Yancey and W. W. Koontz. Advance enrollments: Drs. H. Armstrong, B. H. Beydler, A. C. Byers. F. L. Byers, W. F. Fahrney, W. W. Koontz, M. T. McCulloch, J. D. Miller,

R. L. Shuler, J. E. Wine, Charles Watson, and B. S. Yancey.

LURAY: The class meets on Tuesdays at 2:30 P. M. in the Courthouse. Local committee in charge of membership and clinical material: Dr. George H. Long. Advance enrollments: Drs. F. Thos. Amiss and G. H. Long.

FRONT ROYAL: The class meets on Wednesdays at 10:00 A. M. in Mrs. Johnson's Woman's Hospital. Local committee in charge of membership and clinical material: Dr. D. M. Kipps. Advance enrollments: Drs. C. H. Armentrout, E. W. Brown, O. W. Carper, Meyer Cohen, E. L. Grubbs, L. F. Hansbrough and D. M. Kipps.

WOODSTOCK: The class meets on Thursdays at 3:00 P. M. in the Courthouse. Local committee in charge of membership and clinical material: Dr. C. H. Spiggle. Advance enrollments: Drs. George Crawford, L. C. Haynes, Harold Miller, Geo. W. Parrott and C. H. Spiggle.

WINCHESTER: The class meets on Fridays at 3:00 P. M. in the Winchester Memorial Hospital. Local committee in charge of membership and clinical material: Drs. B. B. Dutton and C. O. Dearmont. Advance enrollments: Drs. L. M. Allen, C. R. Anderson, P. W. Boyd, R, F, Cline, C, O, Dearmont, B. B. Dutton, Thomas Gibson, J. E. Harris, C. H. Iden, J. A. Miller, H. I. Pifer, E. B. Powers, F. E. Tappan and T. A. Williams.

Post-Graduate Courses Win Approval Again.

The comments solicited from each member of Dr. Lapham's classes in prenatal and postnatal care are at this writing being received from the six Peninsula groups. All of them have revealed the same marked approval and testimony of value received that have been accorded the courses by previous members. The number of those who have rated the lectures of the course excellent or good is forty-two times as large as those who rated them lower; the ratio of those who considered the course worth the time and money expended, as opposed to those who did not, is forty to one; and the ratio of those who desire similar courses in the future is twenty-six to one who is uninterested.

Seventeen Weeks to the End.

The appropriation made by the Medical Society at the Lynchburg meeting, with the addition of part of the previous allotment of the Commonwealth Fund which would ordinarily have reverted, provides for the continuance of the program of prenatal and postnatal instruction until October 1st. Exactly seventeen weeks of Dr. Lapham's service remain for assignment. The medical societies and individual physicians in the northeast territory, extending east from the mountains and south to Fredericksburg, have been notified that arrangements will be made for courses to be conducted in their territory if it is desired. The next circuit will start in the week beginning June 4th.

GEORGE W. EUTSLER,
Secretary, Joint Committee.

Proceedings of Societies

Virginia State Board of Medical Examiners.

At the meeting of the State Board of Medical Examiners in December, the following received licenses to practice medicine in this State:

Dr. Albert Victor Anderson, Portsmouth, Va.
Dr. John B. H. Bonner, Powhatan, Va.
Dr. Paul Douglas Camp, Jr., Richmond, Va.
Dr. William Gayle Crutchfield, Richmond, Va.
Dr. William Lloyd Eastlack, South Boston, Va.
Dr. Charles Louis Gilbert, Richmond, Va.
Dr. Robert Orrus Glenn, Valle Crucis, N. C.
Dr. William H. Gordon, Baltimore, Md.
Dr. John Edward Hamner, Richmond, Va.
Dr. Lynwood G. Houser, East Radford, Va.
Dr. Ellsworth Julian Johnson, Winchester, Va.
Dr. William Reily Jordan, Richmond, Va.
Dr. Alice Hege Keissling, Falls Church, Va.
Dr. James Henry Nelson, Jr., Hinton, W. Va.
Dr. Edward B. Richey, Lynchburg, Va.
Dr. David Herman Rosenfeld, Richmond, Va.
Dr. Carl William Shaffer, Alexandria, Va.
Dr. Norman Eric Tylar, Petersburg, Va.
Dr. Claude M. Vaughan, Russell, Ky.

The Medical Society of Northern Virginia

Held a called meeting in Winchester, Va., February 9th, upon the request of Dr. Southgate Leigh, Norfolk, chairman of the Committee on Group Societies of the Medical Society of Virginia. The president, Dr. George Crawford, of Strasburg, presided. After Dr. Leigh had appeared before the Society and urged the formation of county units, the fol-

lowing resolution was passed: "Resolved, That Skeleton County Societies be formed in each county which held membership in the Medical Society of Northern Virginia and that the President of the Medical Society of Northern Virginia appoint a Provisional President in each county and he in turn appoint his own secretary in his respective county. These Provisional officers are to serve until the next regular meeting of the Medical Society of Northern Virginia, at which time said appointments may be confirmed by the Society in regular session."

The Provisional officers appointed for the respective counties are as follows:

CLARKE: Dr. C. O. Dearmont, White Post.
WARREN: Dr. D. M. Kipps, Front Royal.
SHENANDOAH: Dr. W. C. Ford, Woodstock.
FREDERICK: Dr. H. H. McGuire, Winchester.
RAPPAHANNOCK: Dr. J. G. Brown, Woodville
PAGE: Dr. George Long, Luray.

J. EDWARD HARRIS,
Secretary.

Joint Meeting.

The Fauquier County Medical Society and the Loudoun County Medical Society held a joint meeting in Warrenton, Va., on the evening of February 15th, as guests of Dr. J. Frank Folk and Dr. Martin B. Hiden. All doctors, druggists and dentists in that section of the State were invited and requested to bring one lady guest each.

The president, Dr. John T. Sprague, Warrenton, presided over the business session and Dr. M. B. Hiden, also of Warrenton, was at the secretary's desk. Several of those present spoke with regret of the death of Dr. B. H. Swain, of Ballston, and a committee composed of Dr. W. O. Bailey, Dr. G. Frank Simpson and Dr. M. B. Hiden was appointed to draw up resolutions on his death.

Dr. Hiden spoke of the question of the license tax on doctors which had been proposed by the State Legislature and a resolution was unanimously passed condemning this tax and requesting the legislators representing this section to oppose it. After discussion of several other matters, supper was served. This was followed by a dance which lasted for several hours.

Lee County Medical Society.

Officers of this Society for the year 1934 are as follows: President, Dr. W. J. Innes, Pennington Gap; and secretary, Dr. J. B. Muncy, also of Pennington Gap.

Southside Virginia Medical Association.

The one hundred twenty-first quarterly session of this Association convened in the lecture hall of the Medical Centre at the Central State Hospital on the afternoon of March 13th. A full attendance was present and a very interesting and instructive program was rendered. A delightful buffet supper, served by Dr. H. C. Henry and his staff, was enjoyed by the visiting doctors. The society then adjourned and will hold its mid-summer meeting on the second Tuesday in June.

Dr. H. C. Jones, Petersburg, is president, and Dr. R. L. Raiford, Franklin, secretary.

News Notes

Our Alexandria Meeting.

The Alexandria Medical Society has appointed the following committees and chairmen to look after the various details in connection with our sixty-fifth annual meeting to be held in Alexandria, Va., October 9th, 10th and 11th:

GENERAL CHAIRMAN, Dr. S. B. Moore.
VICE-GENERAL CHAIRMAN, Dr. H. A. Latane.
PUBLICITY, Dr. L. Powell.
GOLF, Dr. W. T. Burch.
FINANCE, Dr. W. E. Beattie.
SCIENTIFIC EXHIBITS, Dr. C. L. Fifer.
COMMERCIAL EXHIBITS, Dr. H. A. Hornthal.
HOTELS AND MEETING HALL, Dr. O. A. Ryder.
AUTOMOBILES AND RECEPTION, Dr. J. W. Love.

The George Mason Hotel will be headquarters for our meeting. Though other rooms are available, it is suggested that members make reservations as promptly as possible, by writing direct to the hotel. This will avoid a last minute rush. Rates quoted by the George Mason are:

Single room—double bed, running water and toilet, $2.00 per day per person.

Single room—double bed, shower bath, $2.50 per day per person.

Single room—double bed, tub bath, $3.00 per day per person.

XUM

Double room—double bed, running water and toilet, $3.00 per day for two persons.

Double room—double bed, shower bath, $3.50 and $4.00 per day for two persons.

Double room—double bed, tub bath, $4.00 and $5.00 per day for two persons.

Double room—twin beds, tub bath, $5.00 and $6.00 per day for two persons.

The Clinch Valley Medical Society

Will hold its Spring meeting in Norton, Va., on April the 28th. An interesting program has been arranged including an address by the President, Dr. J. M. Daugherty, Nickelsville, and papers by Dr. N. W. Stallard, Dungannon, and Dr. James P Williams, Richlands. Dr. J. Shelton Horsley and Dr. Douglas G. Chapman, both of Richmond, Va., will be invited guests and will appear on the program. Dr. C. B. Bowyer, Stonega, is secretary.

The Tri-State Hospital Conference,

Composed of the North and South Carolina and Virginia Hospital Associations, will meet at Charlotte, N. C., beginning on the night of Wednesday, April 18th, and running through to noon of Friday. April 20th. In addition to papers prepared by members of the several associations there will be speakers from a distance. One of the subjects to be given considerable attention will be hospital insurance. Attendance from all hospitals is invited.

Dr. L. E. Jarrett, Memorial Hospital, Richmond, is secretary of the Virginia section.

Dr. Allen Freeman to Succeed Dr. W. H. Frost.

Dr. Wade Hampton Frost will retire as dean of Johns Hopkins School of Hygiene and Public Health, upon expiration of his term in July, after which he plans to devote his entire time to his duties as professor of epidemiology.

Dr. Allen Weir Freeman, professor of public health administration at Johns Hopkins will succeed Dr. Frost as dean.

Both Dr. Frost and Dr. Freeman are natives of Virginia and have been engaged in health work for a number of years—Dr. Frost formerly with the U. S. Public Health Service and Dr. Freeman with health work in Virginia and Ohio.

Medical College of Virginia News.

The regular scientific monthly meeting of the staff of the college was held Thursday, March 8th. The program was as follows:

Gangrene, by Dr. G. Paul LaRoque.

Acidosis and Alkalosis, by Dr. Frank L. Apperly with the discussion opened by Dr. J. C. Forbes.

The Stuart McGuire lectures, by Dr. Frank C. Mann, professor of experimental surgery, The Mayo Foundation, Rochester, Minn., with which will be combined the annual spring post-graduate clinics of the College, will be held April 2nd and 3rd. It is expected that a large number will be present for these lectures and clinics.

The monthly report for the out-patient department shows 4,606 patient visits for the month of February.

Dr. Harry Bear, dean of the school of dentistry, Dr. Arthur P. Little, professor of prosthetic dentistry, and Dr. S. F. Bradel, assistant professor of crown and bridge prosthesis, attended the annual meeting of the American Association of Dental Schools in Chicago, March 18th-20th.

Dr. W. E. Bundy, of Minden, W. Va., class of '08, was a recent visitor to the college.

Dr. Seth Gayle, class of '27, is now located at Scottfield, Ill., with the army air corps. He was a recent visitor to the college.

News From University of Virginia, Department of Medicine.

At the meeting of the University of Virginia Medical Society on February 19th, Dr. W. H. Goodwin spoke on the subject of Subcutaneous Injury of Intra-Abdominal Organs by Blunt Forces; Dr. Alfred Chanutin spoke on Studies on Partially Nephrectomized Animals.

At the meeting on March 5th, Dr. E. L. Corey spoke on the subject of Physiology of the Mammalian Fetus; Dr. E. P. Johnson spoke on Etiology and Histogenesis of Leucosis in Fowls.

New York Polyclinic Medical School and Hospital.

Special lectures and papers were presented in March at New York Polyclinic Medical School and Hospital, as follows:

Wednesday, March 14th, a special lecture by Dr. Russell L. Cecil (Professor of Internal

Medicine, New York Polyclinic Medical School and Hospital) on Rheumatic Fever: Incidence and predisposing factors. The role of the streptococcus in rheumatic fever. Focal infection. Relation of rheumatic fever to bacterial endocarditis and rheumatoid arthritis. The heart in rheumatic fever. Modern treatment and prophylaxis.

Monday, March 5th, Stated Meeting of the Clinical Society of the New York Polyclinic Medical School and Hospital, with the following program:

1. The Educational Program of the American Medical Association. William D. Cutter, M. D., Chicago.

Discussion opened by John A. Hartwell, M. D. (by invitation) and Harold Rypins, M. D. (by invitation), Albany.

2. Cancer of the Stomach. J. Shelton Horsley, M. D., Richmond.

Discussion opened by Harlow Brooks, M. D., Allen O. Whipple, M. D. (by invitation) and the Surgical Staff of the Hospital.

A general discussion followed.

Jefferson Medical College.

The William Potter Memorial Lecture was delivered in the College Building on Thursday evening, March 1, 1934, by Charles R. Stockard, Ph.D., M. D., Professor of Anatomy, Cornell University Medical College, New York City. His subject was "The Genetic Basis and the Internal Secretions in Growth Types and Body Form."

News Notes from Duke University School of Medicine and Duke Hospital.

On February 21st, Dr. John H. Hamilton, Director of the State Laboratory of Hygiene, Raleigh, N. C., lectured on County Health Work.

On March 3rd, Dr. Vonnie M. Hicks held an operative clinic at the North Carolina State School for the Blind, at Raleigh, for the junior and senior students.

On March 6th, Dr. M. V. Ziegler, Director of the Division of County Health Work delivered a lecture on Public Health Work.

The Durham-Orange County Medical Society held its regular monthly meeting at Duke Hospital March 9th, and Dr. Oscar L. Miller, of Charlotte, N. C., presented a paper on Fractures of Both Bones of the Forearm, and Dr. L. Emmett Holt, Jr., of Baltimore, Md., a paper on Observations on the Absorption and Utilization of Fat.

"Health Recovery Campaign."

The Virginia Tuberculosis Association takes part annually in a nation wide educational campaign for the spread of information concerning the prevention and cure of tuberculosis. This year the keynote of the campaign is depicted in the poster which shows public health as a knight with sword drawn against a thief with torch and bag of gold, representing tuberculosis, and bearing the caption "Tuberculosis Robs You—Public Health Protects You."

In these days of high costs and low incomes the taxpayer should be gratified to know that while he only spends 50c in taxes for public health (as compared to $3.80 for roads, $16.17 for schools, $4.52 for police and $3.32 for fire protection), the returns in saving of life have been surprisingly large.

From 1911 to 1931 the average length of life in the United States increased seven years. The infant death rate was only 58 per 1,000 in 1932, while it was 170 in 1900. The death rate of the four principal communicable diseases of childhood has been reduced 60 per cent in ten years.

Tuberculosis, one of the most costly of diseases, has been reduced two-thirds since 1900 due to the concerted efforts of physicians, public health authorities and tuberculosis associations.

In spite of the depression, the death rate from tuberculosis continues to decline and the deaths from this disease in Virginia in 1933 was the smallest number ever reported by the Bureau of Vital Statistics. While this situation is gratifying it should not cause too much optimism as tuberculosis is a slow disease and the effect of the depression upon it may not show itself for several years.

Dr. Frank F. Thweatt, Jr.,

Class of '28, University of Virginia, Department of Medicine, is at present attached to the American Consulate at Naples, Italy. He was transferred in November, 1933, after having served for three years as Medical Officer in Charge, U. S. Marine Hospital, Vineyard Haven, Mass.

Dr. Thweatt was married on December 22, 1933, to Miss Hallie Lee Farrar, of Arrington,

Va., in The Little Church Around the Corner, New York City.

Dr. J. A. Grizzard,

Drewryville, Va., has been appointed by Dr. R. D. Bates, president, as a member of the Committee on Group Societies of the Medical Society of Virginia, to fill the vacancy caused by the death of Dr. E. L. Kendig.

May Day—Child Health Day.

On May 1st will be celebrated the tenth anniversary of the National Child Health Day. The Conference of State and Provincial Health Authorities of North America, which last year assumed the future responsibility for the national conduct of Child Health Day, has elected to continue the use this year of the slogan "Mothers and Babies First."

The Medical Society of the State of North Carolina

Will hold its annual meeting at Pinehurst, N. C., April 30th through May 2nd, under the presidency of Dr. I. H. Manning, Chapel Hill. Dr. L. B. McBrayer, Southern Pines, is secretary of the Society.

Dr. Harvey G. Bland

Has located in the Medical Arts Building, Newport News, Va., for the practice of surgery. He is a native of Middlesex County, Va.. but was recently located in Tennessee. Dr. Bland graduated from the Johns Hopkins University School of Medicine in 1927.

Dr. J. Shelton Horsley,

Richmond, Va., was a guest speaker before the Clinical Society of the New York Polyclinic Medical School and Hospital, New York City, on March 5th, the subject of his address being "Cancer of the Stomach."

While on this trip, Dr. Horsley also attended the meeting of the Directors of the American Society for the Control of Cancer in New York.

Dr. Allen Southall Lloyd,

Class of '28, Medical College of Virginia, opened offices in Wainwright Building, Norfolk, Va., April 1st, and will give special attention to orthopedic work.

Dr. N. Thomas Ennett,

Formerly Medical Director of Public Schools of Richmond, Va., in which city he made his home for a number of years, has returned to his native State of North Carolina, where he is located at Mount Airy and engaged in Public Health work in Surry County.

Dr. W. M. Junkin,

Who, for the past four months, has been surgeon to the Petrie Hospital, Murphy, N. C., resigned his position, effective March 15th, to join the staff of the Elkins City Hospital, Elkins, W. Va. Dr. Junkin is an alumnus of the Medical College of Virginia and was formerly connected with the staff of McGuire Clinic, Richmond, Va.

Dr. Joseph T. McCastor,

An alumnus of the Medical College of Virginia, is still in Vienna, Austria, where he is continuing his work in surgery. His wife, Dr. Mary Cousins McCastor, is attending the obstetric clinics in Lausanne, Switzerland. Both report many interesting experiences and plan to remain in Europe another year.

Married.

Dr. Lucius H. Bracey, South Hill, Va.. and Mrs. Gladys Yancey Bramham, Durham, N. C., February 22nd.

Dr. Everett Walker McCauley, Burlington, N. C., of the class of '32, Medical College of Virginia, and Miss Ella IreneWilson, Townesville, N. C., February 2nd.

The Annual Report of St. Elizabeth's Hospital,

Richmond, Va., for 1933 has just been published. It shows 1,126 patients admitted during the year 1933. There were twenty deaths among the operative surgical patients, two among the surgical non-operative cases, seven among the medical cases, and four among the urological cases, making the total number of deaths thirty-three, including two patients admitted in a moribund condition who died within twelve hours after admission. The mortality rate for all deaths was 2.93 per cent, as compared with thirty-seven deaths in 1932 and a mortality rate of 3.10 per cent. The mortality rate for operative surgical cases was 2.96 per cent as compared with 3.34 per cent for 1932.

Appended to the report and constituting an interesting feature of it is a synopsis of all deaths, including remarks on the cases, types of treatment, and report of the necropsies. Twenty-five necropseis (75.76 per cent of all deaths) were done and nineteen out of the twenty surgical operative deaths had necropsies performed.

The out-patient department reports 2,113 visits, including dressings, examinations and treatments during 1933, as compared with 1,440 in 1932. There were 639 ultra-violet ray treatments, 238 basal metabolism examinations, 120 electrocardiograms, and 480 microscopic tissue examinations.

Dr. Samuel H. Justa,

Class of '33, Medical College of Virginia, has located at Macclesfield, N C., where he will be engaged in general practice.

Dr. Stuart McGuire,

Richmond, Va., was in February elected president of the Richmond Alumni Chapter of Phi Beta Kappa, for the coming year.

Dr. Paul Kells,

Recently an instructor in medicine at the University of Virginia, Department of Medicine ,has located at Miami, Fla., with offices at 405 N. E. 90th Street.

Clinical Medicine and Surgery Changes Hands.

Forty years ago, *Clinical Medicine and Surgery* was founded by the Abbott Laboratories, under the name of *The Alkaloidal Clinic*, and, with various changes of name and editorship, has been owned by them ever since.

For the past ten years, the journal has operated under the editorship of Dr. George B. Lake. The sole ownership of the journal now passes to Dr. Lake, who will continue its independent editorial policy, in form and in fact as well as in policy. The new editorial and business offices of the journal are in the Medical and Dental Arts Building, Waukegan, Ill., with a Chicago office at Room 670, 410 No. Michigan Ave.

The American Association on Mental Deficiency

Will hold its annual meeting at the Hotel Waldorf-Astoria, New York, May 26, 27, 28 and 29, 1934. The Saturday session, May 26th, will be given over to the sociological, psychological and the special educational aspects of the problem in order that local social workers and school teachers may have an opportunity to attend without interfering with their regular duties. The Tuesday afternoon session will be a conjoint meeting with the American Psychiatric Association. Data as to the program may be obtained from the Secretary, Dr. Groves B. Smith, Godfrey, Ill.

A Correction.

We recently announced in error that Dr. Charles A. Easley, Jr., was located at Dry Fork, Va. Dr.Easley's father is located at Dry Fork, but Dr. Charles A. Easley, Jr., is working with the du Pont Plant at Belle, W. Va.

For Sale—

Castle Electric Combination instrument and dressing sterilizer at $40.00. Good condition. Address "H-O-W," care this Journal. (*Adv.*)

For Sale—

Mahogany finish Allison office treatment set. Practically new. $250.00. For further information, address "N. A. B.," 308 N. 12th St., Richmond, Va. (*Adv.*)

Location for Physician.

Physiotherapy nurse would like to rent apartment suitable for office and home to physician desiring location in residential section. For information, apply to "Apartment 1," 1419 Laburnum Avenue, Richmond, Va.

For Sale—

X-ray machine, Gwathmey gas outfit, sterilizer, microscope, cautery, cystoscope, suction apparatus, operating table, other equipment in good condition. Reasonable price, as a whole or part.

Address "K. B. H.," care this Journal, 1200 E. Clay Street, Richmond, Va. (*Adv.*)

For Sale—

One Ultra-Violet Ray Machine, purchased from the General Electric X-Ray Corporation. V-2888, 110 volt, A. C., 60 cycles, Model C No. 63531, Tube No. 33655, with generator. This machine has been slightly used and is in good condition. For sale for $150.00 cash. Write "C. T. C.," P. O. Box 1895, Richmond, Va. (*Adv.*)

Obituary Record

Dr. William Latane Varn,

Of South Hill, Va., died at a Richmond hospital, March 21st, after a short illness which started with an infection of his left hand. Dr. Varn was forty-three years of age and a graduate of the Medical College of Virginia in the class of 1915. He practiced for a time in Cum-

berland County, Virginia, before locating in South Hill about eight years ago. Dr. Varn was a member of the Medical Corps of the Army during the World War. He was prominently identified with the civic and professional life of his community, being president of the South Hill Rotary Club, president of the Mecklenburg County Medical Society, service officer of the American Legion, a prominent Mason and a vestryman of All Saints Episcopal Church of South Hill. He had been a member of the Medical Society of Virginia since shortly after locating for practice in this State. He is survived by his wife, four children, his parents and a large family connection.

Dr. Robert Daniel Tucker,

Prominent physician of Powhatan County, Va., died March 13th. He had been in ill health for more than a year. Dr. Tucker was seventy-two years of age and graduated in medicine from the former Columbian University, Washington, D. C., in 1892. He had practiced in Powhatan for forty years and was president of the Powhatan Bank, chairman of the county board of supervisors, and chairman of the Powhatan Democratic Committee. Dr. Tucker had been a member of the Medical Society of Virginia since 1894. His wife survives him.

Dr. William Penn Reese,

Well known physician of Franklin County, Va., died February 22nd at his home at Taylor's Store. He was eighty-six years of age and a graduate of the University of Pennsylvania, School of Medicine, in 1872. Dr. Reese had been a member of the Medical Society of Virginia for fifty-six years. He was also one of the oldest members of the Phi Gamma Delta fraternity. Two daughters and two sons, one of whom is Dr. G. H. Reese, of Petersburg, survive him.

Resolutions on the Death of Dr. Benjamin Hallowell Swain.

At a special meeting of the Arlington County Medical Society on February 21, 1934, the following resolutions were adopted:

WHEREAS, God in His infinite wisdom saw fit to remove from our midst on January 28, 1934, our friend and colleague, Dr. Benjamin Hallowell Swain,

BE IT RESOLVED, That in the death of Dr. Swain this Society lost one of its most beloved and ardent members. Dr. Swain was born in Alexandria, Va., November 21, 1859. He received his degree of Doctor of Medicine from the George Washington University, in 1906. Dr. Swain and his family moved to Arlington County in 1917, where he practiced his profession actively until his death. He was county coroner for fifteen years, and took an active interest in county affairs. He was secretary of the Arlington County Medical Society for fifteen years. He was an active member of the First Baptist Church of Clarendon.

BE IT FURTHER RESOLVED, That a copy of these resolutions be spread on the minutes of the Society, a copy sent to the VIRGINIA MEDICAL MONTHLY, and a copy to the family.

R. N. SUTTON, M. D.,
Secretary.

Dr. Clarence Hyde Saunders,

Widely known physician of Chase City, Va., died March 14th, after an illness of several weeks. He graduated from the College of Physicians and Surgeons, Baltimore, in 1891. Dr. Saunders had been a member of the Medical Society of Virginia for twenty-five years. His wife and two daughters survive him.

Dr. Edgar Bentley Noland,

Bassett, Va., died suddenly March 2nd. He was forty-five years of age and a graduate of the College of Physicians and Surgeons, Baltimore, in 1910. Dr. Noland served as Lieutenant in the Medical Corps during the World War and saw duty overseas. He located at Bassett following the war. Dr. Noland was formerly a member of the Medical Society of Virginia. He is survived by his father, Dr. B. F. Noland, of Loudoun County, two sisters and two brothers, one of whom is Dr. Stacy T. Noland, of Clarendon.

Resolutions on Death of Dr. J. W. C. Jones.

WHEREAS, on February 8, 1934, Dr. John Walker Carter Jones passed to his reward:

BE IT RESOLVED, That the Warwick County Medical Society has lost a most valuable member, a friend of all mankind, a noble soul who was unselfish in his dealings with his fellowman, a supporter of every civic good in the community, an outstanding citizen.

He always took a foremost place in medical affairs and was loyal to his brother physicians. He was deeply beloved by every physician and adored by the multitude who were fortunate to be under his ministrations.

He was an oculist and otolaryngologist of singular ability, enjoyed a large practice and contributed much to the furtherance of his specialty. He stood for all that was good and clean in the practice of medicine, and had a supreme distaste for the sham and the make-believe. He had membership in various civic and fraternal associations, and was an active member of the Episcopal Church.

BE IT RESOLVED FURTHER, That the members of this Society convey their deepest sympathy to his family, and a copy be published in the VIRGINIA MEDICAL MONTHLY.

CLARENCE PORTER JONES,
R. A. DAVIS,
E. W. BUCKINGHAM,
Committee.